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MADRAS INFORMATION

SEPTEMBER 1961

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This month's cover

A lovely view of the Vaigai Dam and its extensive parks is caught in the cover of this number which takes note of the fact that Tourism in the State is growing and presents a special article on the Vaigai Dam as a Tourist Centre.

Paradise for Tourists....

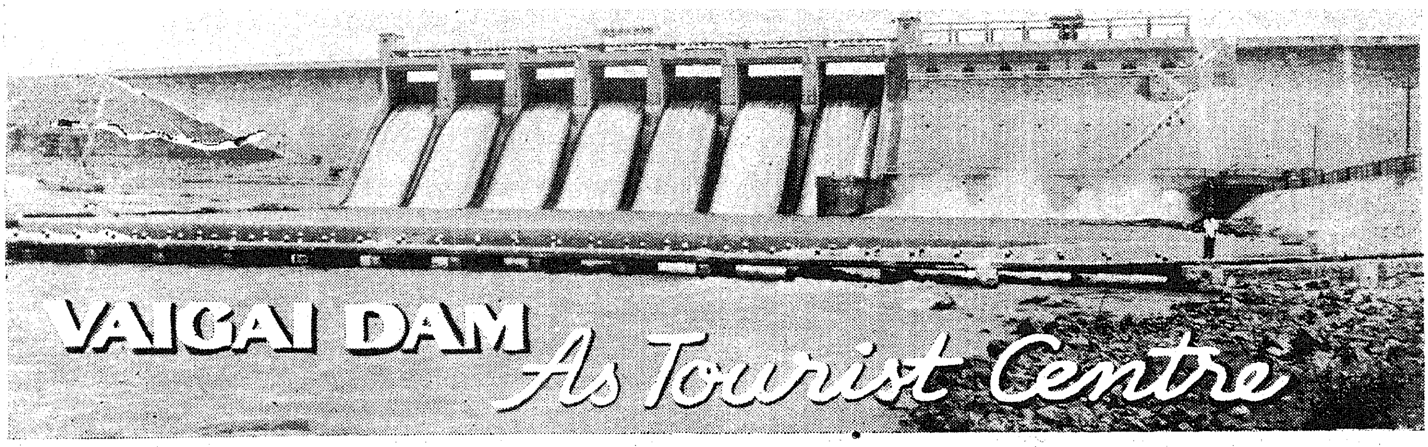
There are Excellent Reasons why the Traveller down South finds Madras State a veritable Paradise for Tourists.

Towering Temples of surpassing beauty and ageless grandeur provide him endless aesthetic thrills here.

Ootacamund, the Queen of Hill stations and Kodaikanal, the Jewel of the South assure alluring prospects of fine climate and visual delight. And the invigorating Courtallam Falls offer incomparable pleasures for Holiday-making.

The Mudumalai Game Sanctuary in Nilgiris district and the Vedanthangal Birds Sanctuary near Madras promise other surprises. So, do not tarry....

VISIT MADRAS STATE



VAIGAI DAM As Tourist Centre

[Following up the suggestion of Chief Minister Kamaraj, who, while inaugurating the Vaigai Dam in January 1959, pointed out the possibilities of developing a first rate tourist centre there, Government have taken necessary steps and the area is today a very popular tourist and picnic spot. With growing pressure of tourist traffic to the place, amenities to match up to needs have been provided. There are separate rest houses for adult and children's parties. The Chief Minister during his visit there recently in May this year inaugurated a Cafeteria, on Information Centre, the children's train and a model of the Periyar-Vaigai System. This article gives an account of the tourist centre at Vaigai Dam and traces its development.]

The Vaigai dam, constructed across the river Vaigai in 1959, is situated in Periyakulam taluk of Madurai district in Madras State. It is 40 miles from Madurai, 28 miles from Kodai road railway station, 54 miles from the Hill Station Kodaikanal, and 48 miles from Thekkedy, the famous Periyar Game Sanctuary. It is connected by a network of roads from Periyakulam, Theni, Andipatti and neighbouring towns. The nearest railway station is at Andipatti at a distance of five miles.

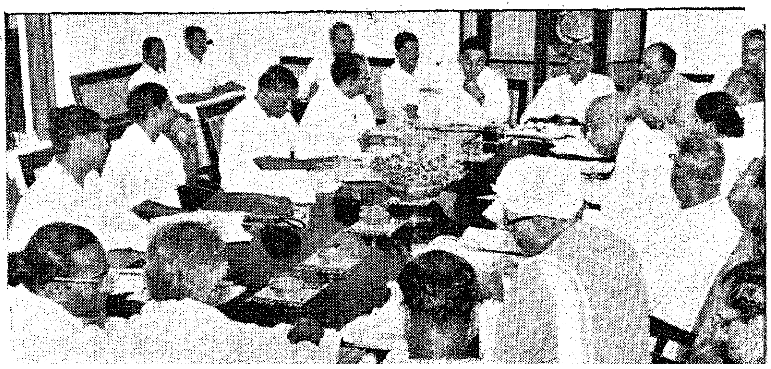
As early as in 1893, the west flowing waters of Periyar river, otherwise running waste into the Arabian sea in erstwhile Travancore State, were diverted by the construction of a masonry dam at an elevation of 3,000 ft. above mean sea level through a mile long tunnel on to the Cumbum valley to irrigate a lakh and thirty thousand acres of land in Madurai and Ramanathapuram districts. The diversion of water from the western slope into the Cumbum valley afforded great potentialities for power generation.

The suggestion

The ever increasing power demand required the immediate construction and installation of a Hydro-Electric Project to utilize the Periyar waters under which water could be drawn from the Periyar lake throughout the year for power generation instead of only nine months for irrigation purposes, as was done hitherto. A subsidiary reservoir was found necessary to be constructed lower down to store and preserve the summer draw of the Hydro-Electric Project from being wasted into the Bay of Bengal. This led to the construction of the Vaigai Reservoir which was commenced in 1954 and inaugurated in January 1959.

During the inauguration of the Vaigai Reservoir Project on 21st January 1959, the Chief Minister, Sri K. Kamaraj, suggested that an extensive park on the rear of the Dam could be formed and developed into an attractive beauty spot for visitors and tourists. Accordingly parks and gardens with enchanting cascades and fountains

Chief Minister Kamaraj presided over the meeting of the State Informal Consultative Committee held in the Cabinet Room of the Secretariat recently. Sri. S. K. Dey, Union Minister for Community Development also participated.



beautifully illuminated were formed. The parks are laid out on an extensive scale over 25 acres of land with life-size statues, flower-beds, children's corner, star canopies, etc., high-lighting it. Thousands visit the place on Saturdays and Sundays when special illumination of the parks and garden, the fountains and cascades is arranged.

Ideal Picnic Spot

With the growth of the Vaigai dam as a tourist centre and an ideal picnic spot, more and more facilities were needed. Three first class rest-houses, five second class rest-houses with two suites in each and a children's rest house to accommodate about 100 children mainly for visiting excursion parties, have been constructed in addition to the project house. With the old loco and truck lines available, a children's train has been laid out for the amusement of children who come in thousands every week-end. As a number of students from schools and technical colleges visit the project, a model of the Periyar-Vaigai river system, depicting the Western Ghats where the Periyar river originates, the Periyar and Vaigai Canals systems, etc., has been prepared and is on view. It has been found very instructive and interesting. The various technical details of construction of the project are exhibited in a chart room next to the model.

The rapid increase in the number of visitors has necessitated provision of more amenities. A motor launch has been provided for cruising in the lake. A good catering centre to provide food for the visitors and an information centre to give necessary information and particulars have been provided. A good stand for the visitors to wait for the bus was found necessary. This has also been provided. The completion of these amenities marks a significant step in the transformation of Vaigai dam as a tourist centre.

Small Industries Service Institute

The Small Industries Service Institute in Madras gave technical assistance in June last, among others, to a glass factory and an electro-plating unit in the City, roofing tiles and bricks manufacturing unit in Manamadurai and a bicycle components manufacturing unit in Kovur. The institute also designed and fabricated at the Industrial Estate, Guindy, a die for paraffin oil (kerosene) stove for a mofussil company. A pair of flexible moccasins with shrunken upper leather was made specially as an experiment at the Central Footwear Training Centre, Guindy, and was sold to the Union Commerce Minister.

The glass factory in the City which could not run successfully its oil-fired day tank furnace was helped by the institute in solving their problem.

The institute suggested to the roofing tiles and bricks manufacturing unit at Manamadurai the introduction of the belt conveyed and roller feed system which will mechanize the unit and reduce the cost of labour besides increasing the quantum of production.

The Kovur unit, manufacturing bicycle components, baby tricycles, perambulators, etc., was advised by the institute in setting up a debrassing unit.

An electro-plating unit in the City, which is doing job of chromium plating work for bicycle and automobile components, experienced difficulty in getting the correct thickness in minimum time with indigenously available readymixed salts. The institute provided technical assistance in obtaining the correct thickness in the nickel plating salt bath.

holiday at VAIGA

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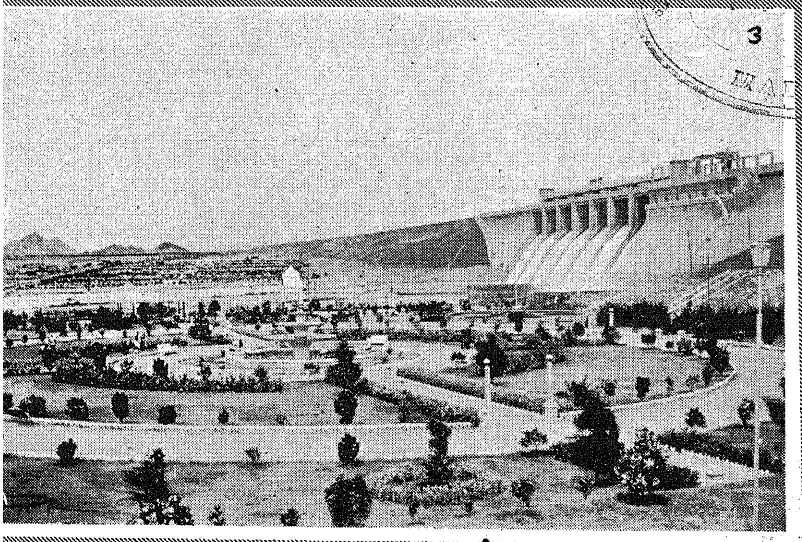

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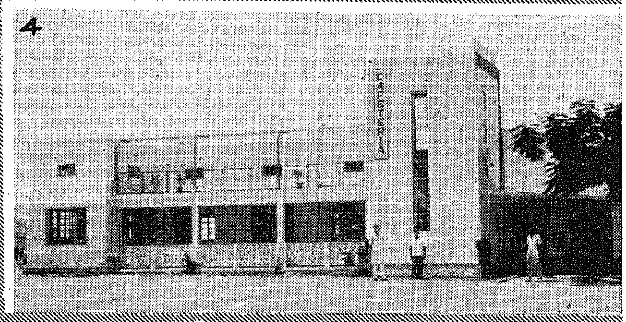

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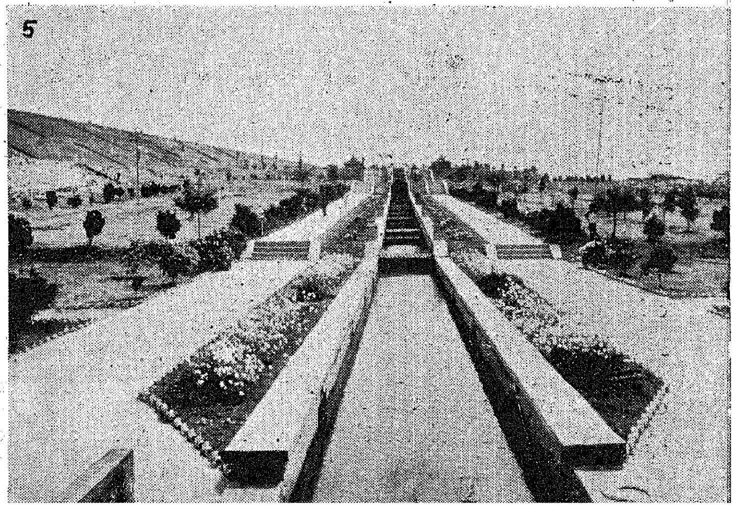

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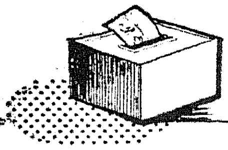
Following up the Chief Minister's suggestion, the Vaigai Dam has been developed as a first-class tourist spot and has become extremely popular for holidaying. On account of the pressure of tourist traffic, a cafeteria, an enquiry office, etc., have sprung up there. (1) Inauguration by the Chief Minister of the Enquiry Office, Cafeteria, etc., (2) The Enquiry Office, (4) The Cafeteria, (3) and (5). Views of the parks.



Don't Miss YOUR VOTE

[Exercise of the franchise is the hallmark of intelligent citizenship under democracy. Nobody should miss the vote to which he is entitled. Copies of the draft electoral rolls have been made available for inspection and these draft rolls with the final list of amendments will be the final rolls to be used for the 1962 *General Elections. The detailed instructions and appeal recently broadcast by the Chief Electoral Officer from All-India Radio, Madras, on this subject, form the text of this article*].

S. P. SRINIVASAN, *Chief Electoral Officer.*

I have talked to you once before in March this year on the programme of annual revision of electoral rolls for 1961. For each Assembly constituency there is a person responsible for the preparation of the rolls called Electoral Registration Officer. These are usually the Revenue Divisional Officers in the mufassal and the concerned Municipal Commissioners where the entire constituency lies within the Municipality. In Madras, the Electoral Registration Officer is the Revenue Officer of the Corporation of Madras. Draft electoral rolls have been prepared by these officers in all constituencies in the State and are being published now.

Copies of the draft rolls will be made freely available for inspection in the offices of Sub-Registrars, important schools, Municipal and Panchayat Offices, etc. If a person finds that his name is not included in the draft electoral rolls, he can file a claim for including his name in the rolls. A voter can also prefer an objection to the inclusion of the name of any other person in the roll or in respect of entries in the draft rolls relating to his own name. The claims and objections can be preferred to the Electoral Registration Officer, concerned Tahsildars, Firka Revenue Inspectors, Executive Officers of Cantonments, township and Town panchayats and Village Officers. Claims and objections should reach them before the last date prescribed, i.e., 30 days from the date of publication of the rolls in respect of each Assembly constituency.

Claims and Objections

Claims and objections should be preferred in the prescribed forms which can be got from the above officials on payment of cost. Manuscript, typewritten or cyclostyled forms also will be accepted. A person desiring correction of any entry in the roll relating to himself should apply in the form prescribed therefor. However, in cases of obvious printing and clerical mistakes noticed in the rolls it is sufficient if they are brought to the notice of the Electoral Registration Officer by a letter.

A claim should be signed by the claimant. It should also be countersigned by a voter whose name has been included in *that* particular part of the roll in which the claimant desires his name to be included. Similarly, every objection to the inclusion of a name should be signed by the objector and it should also be countersigned by another person whose name is already included in that part of the roll in which the name objected to appears. An objection to a particular or particulars in an entry can be preferred only by the person to whom that entry relates and in such cases no countersignature of another voter is necessary. The claimant or the objector should himself fill in all the entries in the relevant form. In case an objector wants to prefer an objection in respect of more than one person he should file a separate objection in respect of each such person.

Transfers

If a person desires to have his name transferred from the electoral roll of one constituency to another constituency or from one part of the electoral roll to another part of the roll, it is enough if he furnishes the particulars in Form 6 and gives correctly the address of his previous enrolment in that Form.

All claims and objections received by the various authorities will be enquired into and disposed of at the public sittings held by the Electoral Registration Officer in convenient centres in the constituency. A notice regarding the time, date and place fixed for the public sittings will be served upon each claimant or objector. The enquiry will be only summary. The claimant, the objector

and the person objected to is entitled to appear and be heard during the enquiry. The claimant or objector should attend the hearing and be ready with his evidence.

Final Decision

In disposing of the claims and objections, the Electoral Registration Officer may informally associate with the enquiry representatives of recognized political parties who are familiar with the inhabitants of each area. The final decision in respect of each claim or objection will be the sole responsibility of the Electoral Registration Officer and the representatives of the political parties will have no voice in the matter except that their presense will discourage false claims and objections and they would be free to bring to the notice of the Electoral Registration Officer by way of giving formal evidence, if necessary, any facts which would be useful in coming to a correct decision.

With reference to the decisions made on the claims and objections, the Electoral Registration Officer will prepare the final lists of amendments for the constituency. The draft rolls together with the final list of amendments will be the final roll for the constituency and this will be used for the ensuing General Elections in 1962.

Appeals

An appeal will lie from any decision of the registration officer on the claims and objections, to the appellate officer within a period of fifteen days from the date of announcement of the decision. The appellate officers are the Commissioner, Corporation of Madras, in the Madras City and the Collectors elsewhere. The appeal should be in the form of a memorandum signed by the appellant and should be presented in person or sent by registered post so as to reach the appellate officer within that period. The decision of the appellate officer is final.

Co-operation necessary

The Election authorities are taking all possible steps to make the electoral rolls as up-to-date and correct as possible. But, until and unless the public, the political parties and other social organisations and, above all, the eligible voters themselves, take genuine interest in putting claims and objections within the prescribed period, it would almost be an impossible task to bring out an accurate and perfect electoral roll. I once again emphasise that the rolls now prepared will be used for the ensuing General Elections and unless the qualified persons take steps to enrol themselves now, they may not be able to exercise their franchise during the General Elections.

It is imperative that all eligible persons enrol themselves now as voters. I therefore appeal to all political parties, social organisations and all members of the public to take a genuine interest in the work to see that the names of all eligible persons are registered as voters and to extend their co-operation to the Election authorities in the matter in the fullest measure.

Training in Food Technology

The Ministry of Scientific Research and Cultural Affairs have, under the Practical Training Stipend Scheme 1961–62, offered facilities for candidates for practical training in food technology.

Six candidates holding diplomas in Chemical Technology will be selected for this training which will be imparted at the Union Government-owned quick freezing and cold storage plant at Bombay. The training will last for about a year and the selected trainees will be paid a stipend of Rs. 100 per month.

The course will include studies in the maintenance and operation of refrigeration plants and techniques of ice manufacture and storage and freezing and storage of fish.

Details of the scheme as well as application forms can be had from the Education Officer (Technical), Western Regional Office, Government of India, Construction House, Ballard Estate, Bombay-1.

Industrial Relations in 1960–A Report

[The maintenance of industrial peace continues to be the cardinal aim of Government's labour policy and the results of this policy in the sphere of industrial relations have been satisfactory. This article gives the salient points relating to the working of the Industrial Disputes Act for the year 1960.]

The main aim underlining the Labour Policy of the Government continued to be the maintenance of Industrial peace. Recognising the importance of the development of Co-operative arrangements evolved by the parties themselves, emphasis has been laid on settlement of disputes by voluntary direct negotiations at bipartite or tripartite level and Government intervened only when other methods failed. The voluntary acceptance of the Code of discipline was another significant development which indicated that the employers and workers have come to realise that this was an important factor in the promotion of industrial peace and national development.

The achievement in the sphere of industrial relations during the year was fairly satisfactory. This is reflected in the amicable settlements reached in a number of disputes either as a result of direct negotiation between the parties or on the intervention of the conciliation officers or through the good offices of the Government.

Disputes Settled

The statement below indicates the number of disputes raised and settled by mediation, conciliation or adjudication in the year under review as compared to the previous years.

		Year 1958.	Year 1959.	Year 1960.
1	Number of complaints received.	10,637	9,781	9,048
2	Number of disputes settled by mediation.	8,643	8,177	7,643
3	Number of disputes settled by conciliation.	718	824	864
4	Number of disputes referred for adjudication.	367	308	250

(Remaining cases were pending enquiry at the end of the year.)

Out of 250 disputes referred for adjudication, 144 related to non-employment of workers.

The following were the important disputes settled during the year :—

1. T.I. Cycles (India), Private, Limited, Madras. Bonus for 1959–60, 1964–65, etc.

2. Implementation of the recommendations of the Central Wage Board for the Cotton Textile Industry by the textile mills in the State.

3. Beedi Industry—Payment of rates of wages.

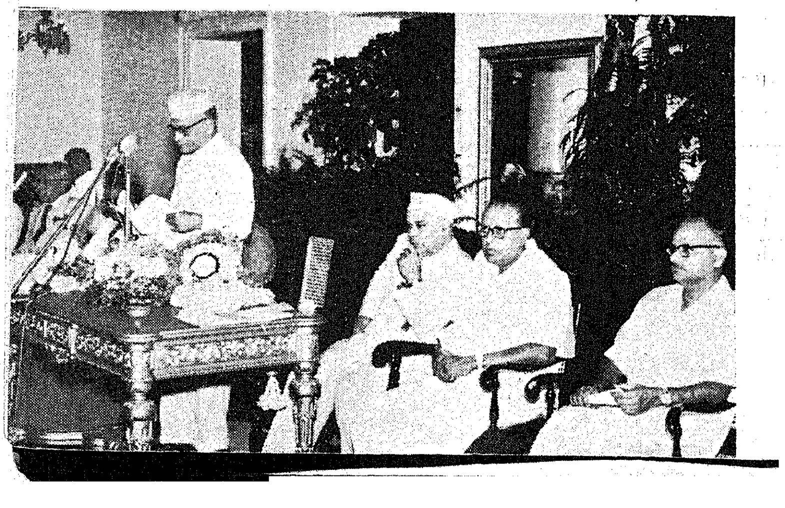
4. Plantation Industry—Bonus for 1959.

There were 318 strikes and 13 lock-outs during this year compared to 202 strikes and 10 lock-outs during the previous year. These stoppages of work involved 220,097 workers and resulted in a loss of 765,990 man-days, compared to 111,072 workers and 1,102,472 man-days in the previous year.

Prosecutions

During the year the Government sanctioned prosecutions against six managements: in 2 cases for non-implementation of awards, in 3 cases for non-implementation of settlements, and in one case for contravention of section 28 of the Industrial Disputes Act.

Sri Manickavelu, Minister for Revenue and Health, inaugurating the All-India State Malarilogists' Conference at Rajaji Hall.



In 1960, recoveries under section 33-C (1) of the Industrial Disputes Act were ordered in respect of 56 managements as against 15 managements last year.

Awards relating to 356 cases were published by the Government in 1960 as aginst 400 cases last year. Of the 356 cases, 42 were decisions of Industrial Tribunals and Labour Courts, under section 33-A of the Industrial Disputes Act.

The following industries continued as public utility services for purposes of the Industrial Disputes Act :—

(1) All Labour in minor ports.
(2) Sugar.
(3) Cotton textiles.
(4) Motor transport services.
(5) Cement.
(6) Air Transport Services.

Works Committees

Formation of Works Committees is a statutory requirement enjoined under section 3 of Industrial Disputes Act upon all employers employing 100 or more workmen. The total number of Works Committees functioning in the State at the beginning of the year was 278. During the year 14 Committees were newly constituted and 2 establishments were exempted from the reconstitution of the Works Committees. The number of Committees functioning at the end of the year was 290.

The Government continued to give wide publicity to the Code of Discipline. The Officers of the Labour Department have been instructed to persuade the employers and employees to ratify the Code. The Evaluation and Implementation Committee which has been entrusted with the administration of the Code considered the question of extension of the Code with a view to securing further ratification by employers' and workers' organisations not affiliated to central organisations and the procedure for dealing with the complaints regarding breaches of the Code. Forty-one employers and 61 trade unions not affiliated to central organisations have signified their acceptance of the Code in writing. During the year, 54 cases of breaches of the Code were investigated as against 71 cases last year.

Evaluation and Implementation

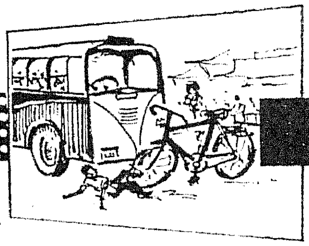
The Tripartite State Evaluation and Implementation Committee was constituted by the Government to look after implementation of wards, settlements, administration of the Code, etc. The Commissioner of Labour is the Chairman of the Committee. The Government have also appointed a senior full-time officer of the rank of Assistant Commissioner of Labour to be Evaluation and Implementation Officer to deal with the implementation and evaluation work.

The Committee met twice during the year under review and considered important subjects like Code of Discipline, effective implementation of the Code of Conduct and the Model Grievance Procedure. In addition, a special meeting of the Committee was convened in July 1960 to discuss the question of implementation of the recommendations of the Textile Wage Board.

A Sub-Committee was formed with the Assistant Commissioner of Labour as the Chairman and with one representative each of the employers and workers to explore possibilities of out-of-court settlements on the appeals made to the High Court and the Supreme Court against the awards of Labour Courts and Industrial Tribunals. With the consent of the members the Chairman of the Sub-Committee has so far settled 3 cases out of court.

Physical Efficiency Drive

Under the revised scheme of the National Physical Efficiency Drive 1,000 testing centres are to be established throughout the country in 1961–62. The number of testing centres is also to be increased by 500 every year so as to bring the total to 3,000 at the end of the Third Plan. The Centres will be established to assess and improve certain fundamental physical qualities of people such as speed, strength, agility, endurance and body balance, under the Physical Efficiency Drive. The Drive is aimed at popularising the cult of physical fitness and arousing the enthusiasm of the people for attaining higher standards of physical efficiency.



PREVENTING ROAD ACCIDENTS

K. RADHAKRISHNAN, *Deputy Commissioner of Police.*

[Speaking at the Madras Medical College on 'Accidents and their Prevention', the subject chosen for the observance of World Health Day in July this year, the Deputy Commissioner of Police, Traffic and Licensing, dealt at length on accidents arising from risks on roads. After examining the main factors that contribute to road accidents, he made a plea for proper traffic education through right propaganda. This article gives the substance of the speech.]

The World Health Organisation prescribed the fascinating theme, 'Accidents and their Prevention' for the World Health Day observed in July this year. The topic is non-technical and gives scope for thoughtful study for layman and specialist alike. Previous themes like 'Ten Years of Health Progress', 'Malaria Eradication', 'Mental Illness', etc., though concerned with public health, provided scope for discussion only for specialists in the field. But the theme chosen this year is of wider significance and has concerned itself with the preservation of human life itself which transcends all health measures.

It is said that accidents take a heavy toll of human lives. Millions young and old, are victims of this fateful form of death all over the world. Millions are maimed and crippled. The mortality figures are so staggering that they surpass the damage to human life that occurred in any war. How to control this mortality rate ? The problem is immense and has to be tackled in a variety of ways to achieve a measure of success.

Accident defined

What is an 'accident' ? The term cannot be explained by means of a crisp definition. An advisory group convened by the World Health Organisation considered it to be "an unpremeditated event resulting in a recognisable injury". The American National Safety Council expanded this definition: "an accident is that occurrence in a sequence of events which usually produces unintended injury, death or property damage". The words 'unpremeditated' and 'unintended' imply the human factor. This definitely rules out accidents like earthquakes, floods, volcanoes and pestilence. Are these simply acts of God unpremeditated and unintended ? Meditation and intention denote a mental condition. Therefore where no human agency is involved in the causation of accidents, it is not preventible.

A lightning hitting a man to death is just his ill-luck. It is of course an accident. He is a victim of circumstances over which he has no control. There are a variety of such types of accidents over which no control can be exercised. Therefore one has to turn to other types of accidents over which some measure of control can be exercised. It is not impracticable to list out the forms of accidents which are "recognised occurrences in which possible injury, death or property damage can be prevented by a policy of premeditated safety measures". It is herein that a lot can be contributed to the safety and well-being of society.

Risks on road

The scientific achievements of this age are stupendous. The results of these achievements have no doubt unleashed new forms of hazards to human life. At the same time scientific advances in the medical field have given today life-saving drugs which were unkown before. The diseases which were considered fatal and were taking a heavy toll of life are controlled and cured by miraculous drugs today. Whether the death rate due to increased accident risk and death control due to marvellous drugs are properly balanced or not, is a debatable issue.

In any case, with the introduction of new types of hazards to human life, fresh techniques and devices are called for to counteract the same. The human being, today, is faced with some form of risk to life whether at home or outside. This article confines itself to the risk of accidents on roads and their prevention.

Not a day passes without the appearance of a news item of a tragic road accident in the newspapers. Of the seven principal types of accidents, viz., "Falls, Drowning, Transport other than motor vehicle, Fire or Explosion, Poisoning, Fire Arms", Motor Vehicles form 36 per cent. It is needless to furnish huge statistical figures to emphasise the fact that millions of lives are lost in road accidents every year all over the world. Nobody ever imagined that the introduction of the automobile would turn the roads into graveyards for so many. The subject of road accidents is posing a knotty problem to everyone. It is engaging the attention of every road user. The more active in the field are the policeman, the engineer, the doctor, the psychologist, the insurance agent, the legislator and safety propagandist. Increased attention is being paid and improved techniques are thought of everyday as to how best to solve this problem.

How do road accidents occur? Could they not be prevented by strict enforcement of traffic laws? Non-observance of traffic laws is not the only factor in the occurrence of traffic accidents. There are a variety of factors and baffling circumstances which come into play in the causation of accidents.

Main factor

The three main factors are the road, the vehicle and the human being. The bad layout of the road and the defective mechanism of the vehicle can be rectified by engineering devices. But the part played by the human being in the sequence of events leading to an accident is a highly complicated one. It is an uphill task to bring him round to a disciplined behaviour on road. The physiological and psychological make-up of the human being is so varied that it is impossible to bring about a satisfactory uniformity by a set policy. The reactions and temperaments vary from individual to individual. The sex, the age, the nationality, the social status, etc., are also factors to reckon with in this connection. Under a given situation, reactions differ from person to person. If these varying factors are taken into account for a mathematical permutation and combination, a fabulous figure will be arrived at, which will upset all safety calculations and requirements.

This explains why accidents cannot be eradicated altogether by a policy of legislation alone. There are enough legal provisions to deal with the road offender. Further stringent imposition of law against the offender will not offer any satisfactory solution to the accident problem. The problem rests mostly on the behaviour pattern of the road user. Accidents do not occur merely on account of the lack of knowledge of traffic law or want of proper driving technique on the part of the man at the wheel. They are often due to failure to exercise commonsense, sound judgment, care and caution.

A dilemma

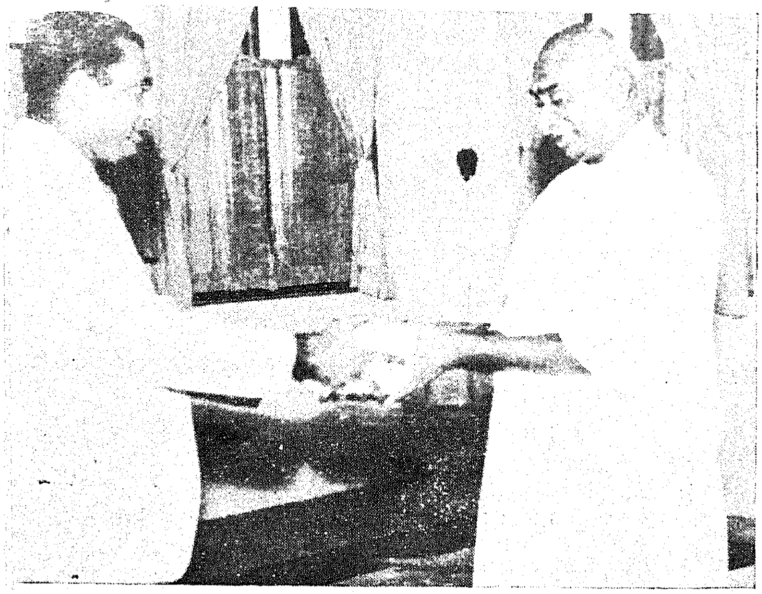
Take for instance the situation on the road, wherein a mother and child are walking along the centre of the road. A vehicle approaches from behind. On hearing the sound of the horn, the mother runs to one side of the road and the child to the other side. Is it safe to drive through the passage created by the two panicky people? It is quite likely that the mother may run towards the child for securing its safety or the child may retrace its steps towards the mother for succour. The driver exercising commonsense will stop the vehicle and proceed only after the two are united. A rash driver kills either the child or the mother or both while manoeuvring his vehicle. It may be argued in law that it is not the rashness on the part of the driver alone that is responsible for the mishap but negligence on the part of the victims is also a contributory factor. The driver may be proved legally not at fault and he may go free.

It is impossible to draw a sharp line between the rashness of the vehicle user and the contributory negligence of the other road user. In a majority of cases it is impossible to prove who is wholly at fault. The legal issues connected with an accident are complicated and open to debate. The determination of legal responsibilities is not the crux of the problem. It is not going to contribute to the reduction of accidents at any rate. Enforcement of law is an administrative measure and it is one of the many ways thereby road discipline can be imposed.

Crying need

Above all administrative measures, relentless safety propaganda is the crying need of the day. Merely publicizing statistics and figures of accidents will not make any impression on the imagination of the masses. The tech-

A section inside the new building of the Madras District Central Library at Mount Road, recently declared open by Home Minister Bhaktavatsalam.



The Assistant High Commissioner of Ceylon, presenting a packet of tea to Chief Minister Kamaraj to mark the formal handing over of ten chests of tea from the Government and people of Ceylon towards relief of distress caused by floods in Tamilnad.

niques employed in propaganda should be really effective and produce useful results. The problem has to be tackled in a realistic manner.

In 25 per cent of the fatal accidents the victims are children. In a majority of cases the parents were negligent and want of due care and caution on their part led to the tragic deaths. It is unreasonable to expect the children to act with mature wisdom on the road. A law may be necessary to hold the driver of the vehicle at fault in all road accidents in which children are killed. It would be worthwhile also to punish by law the negligent parent or guardian for exposing the children to road accident risks by letting them stray on the road.

Common tragedies

It is nothing short of savagery to let innocent children be victimised on the roads through parental negligence. A cyclist darting from a side lane, or using the road in any manner he likes, and getting killed as a consequence will not evoke sympathy. He is punished for his rashness. Cyclists top the list as victims of road accidents in the City. Attention therefore should be diverted mainly towards preventing road accidents to innocent children and teaching the cyclists the value of life.

Frequency of news-items of road accidents in the dailies has become such a routine affair that nobody pays any serious attention. Very few have time to realise the poignancy of such tragic occurrences. Many might not have witnessed the ghastly spectacle at the scene of accident. It should be remembered that every traffic accident has a tragic story behind it. The wailing mother besides the savagely mutilated body of her beloved child, sprightly and full of hope and joy a few seconds before; the breadwinner of a big family suddenly razed to the ground leaving his wife and children in misery are common enough road tragedies. Not many realise that this can occur to any one at any moment.

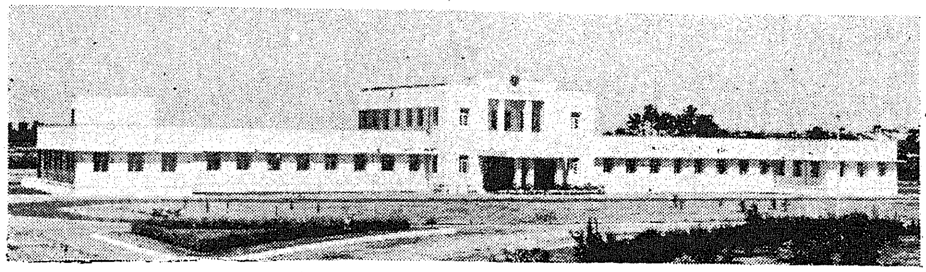
Propaganda needed

Vivid and sustained realization of the appalling horrors involved in accidents and proper traffic education with a touch of emotional appeal are needed. Every one should consider that every life lost in a road accident is a personal loss to the entire community. There is great need for inculcating ' safety consciousness ' in every road user. The school teacher has a part to play in this task. School children should be drilled to develop road discipline. Emerging from behind buses and parked vehicles, playing on the road, riding recklessly on bicycles, running behind moving vehicles and running across without looking out for on coming traffic are the common mistakes committed by school children. Teachers and parents should make children aware of the dangers involved in such mistakes.

It is possible to improve defective road conditions wherever they are found to be responsible for accidents. Traffic signs and regulations if faithfully obeyed by all road users, would certainly result in a fall in accidents. In Western countries, the tragic part played by alcoholism in causing road accident is shocking and experts are not in a position to control it in spite of best efforts. Thanks to Prohibition, Madras State has no such problem. Prohibition has not only saved the health of the alcohol-addict but has also incidentally contributed to safety on roads. Accidents due to alcoholism are very rare occurrences here. But quite a sizable percentage of road accidents is attributable to the folly of the road user. It is only through sustained propaganda that the road user can be trained in higher standards of road discipline.

Electrolytic Engraving on Metals

A quick and economic method for engraving trade-marks, figures or letters on hard metals and alloys in their finished condition has been patented by the Council of Scientific and Industrial Research and released free to industry. The new process has been developed at the National Physical Laboratory, New Delhi. Etching can be completed in about 20 to 30 seconds by this process.



Highways Research Station

K. RAMASWAMI REDDIAR, *Director, Highways Research Station.*

[In this article, the author traces road and traffic developments that have necessitated research in the nature and design of Highways and enumerates the activities of the Highways Research Station, Madras, to meet the challenges posed by these developments].

Madras State has the best road system in our country, with about 28,000 miles. The annual expenditure on them comes to Rs. 365 lakhs for maintenance by way of repairs and renewals. Roughly another 300 lakhs are spent on new construction of bridges and culverts and road improvements and raising of avenues. The State Highways Department controls the entire road system of the State exercising the technical responsibility for roads in Cities and municipalities.

Most of the developments of roads in the past were evolved from cut and dry methods on the highway itself. The surface geometrics and road capacity were kept in keeping with the speed and loads of the vehicles of the day, mostly bullock carts or other animal drawn vehicles, and design features incorporated very little engineering knowledge and experience.

Unbalanced Development

With the advent of the automobile and its phenomenal improvements in capacity in the post-war period, modern vehicles with great speed potential, buses with broad chassis and load capacities, and huge truck-trailer combinations to move heavy packages for industrial development, have come to occupy the roads. The roads of old remained much the same with only surface improving, thus failing to keep pace with the advancement in vehicle manufacture. The result was an unbalanced development in two aspects : on one side, roads were failing prematurely, because of loads in excess of those for which they were constructed, because of the use of inferior sub-grade soil and because of lack of knowledge of materials when the roads were built ; on the other side, transport facilities of speed and load capacity were not fully utilised and this made transportation costs unnecessarily high and increased risks of accidents also.

Need for Research

To suit heavier and faster vehicles, the roads had to be modernised to provide for dual lane carriageways, wider road beds to absorb modern standards and geometrics, and stronger road structures as bridges and culverts to carry heavier loads and all this involved higher costs per mile of construction. It therefore became necessary to make the best use of available funds to meet higher costs of construction to develop new materials, more economical methods of construction and maintenance. Investigations were required to assess the strength of sub-soil conditions to base the design on actual requirements. Also, more knowledge of vehicle behaviour, especially at higher speeds, about the use of mechanical plants to replace older and slower methods of construction were needed.

The Madras Highways Research Station was established to go into these problems and has been functioning since 1957. Its activities are divided under four main sections ; soils ; bitumen and aggregate ; concrete and structures ; traffic and safety.

The principal construction material for most highways is natural soil. The road or bridge is placed upon it and the embankments are made of it. The soil bed combined with the road pavement should therefore be designed to keep down the intensity of traffic forces transmitted to the soil at such low value that permanent deformation is avoided. The object of research now is to find the maximum stress that each type of these soils will carry without significant deformation, and secondly, the load spreading property of various materials, relating their thickness to the traffic forces and properties of the soils. One way in which this is done by the plate bearing test on the subgrade, as the one recently carried out on Mount Road in the City.

The research activities in soils section comprise assessment of strength of soils in foundation beds, examining ways of improving bearing power of soils and investigating how soils can be stabilised as an integral part of the road structure. Particularly for developing low cost roads to serve rural areas much advance has been made after extensive studies on soils and low grade aggregates with the bituminous materials, cement and lime and other waste products like fly ash now increasingly available in factories.

Bitumen Surfacing

Almost all the main lines of communications constituting over 7,000 miles are now provided with black topped surface and maintenance of these sections of roads consumes annually over 10,000 tons of bitumen costing about 30 lakh rupees. Every year further mileage is required to be treated with bituminous surfacing to meet the pressure of increasing motor traffic and the requirements of developing interior areas. Along with the problem of increasing mileage, there is the deterioration of surfacings caused by weather resulting in the disintegration of the bitumen coating and stones parting on account of the destructive action of traffic. Bituminous coating does not stick on well with some aggregates and it gets separated by moisture and gets whipped out under traffic. So it has become important to make economical use of the bitumen with a view to extend not only the mileage of roads but also their useful life and that within the limited allotment of funds. In deciding on the best means of using bitumen a wide range of alternatives is available in the materials ; in the way they are combined and in the overall thickness of construction.

Srimathi Kamaladevi Chattopadhyaya, Chairman, All-India Handicrafts Board, inspecting handicrafts at the Special Armed Reserve Police Camp at Avadi.

Uniform Texture

So research is to be taken up firstly in the combination of base and surfacing required for differing conditions of traffic and subsoil and secondly in the design of durable surfacings which will maintain a uniform non-skid texture throughout their useful life. This involves studying of the effect of weather and traffic on the binders and treated aggregates, testing of the suitability of the stones and offering of suitable designs for such pavements.

The Highways Research Station is also studying presently the possibility of using the Tar that may become available as waste in the Neyveli Lignite Fields, for road construction projects, in replacement of the bitumen now being imported.

Bridges and Load limits

In Madras State until recently lorries and load transport vehicles were permitted with a laden weight of five tons. This limit has been raised to nine tons and now there is a persistent demand for allowing heavier loads of 12 tons and over. But the culverts and bridges on the roads are the links which decide the load limit ultimately. These were constructed in the past, some of them over 100 years ago. Their carrying capacity is not definitely known.

For assessing the strength of these bridges investigations consisting of (1) mathematical analysis, (2) laboratory tests on models and (3) actual load tests on bridges are to be taken up. Some of the load tests conducted in the past by the Highways Research Station include the one on Uppodai bridge at Sathur in 1959 and another more recently, on Napier bridge with heavy vehicles of Neyveli Lignite Corporation. Some more load tests on bridges will be conducted shortly in Salem district. The data collected from these load tests help to arrive at criteria for estimation of the strength of the existing bridges to permit heavier loads and to evolve improvements in the design of bridges.

Numerous culverts and bridges on our roads are either narrow or weak and will have to be reconstructed or replaced. Every year a sizable amount of expenditure on roads is being diverted to reconstruction of existing bridges or for new bridge constructions. These programmes will have to be gone through expeditiously to avoid delay and inconvenience to traffic flow. The conventional methods of bridge and culvert construction involve considerable time lag at every stage, from the foundation to superstructure. A suitable method to speed up this construction process has been found quite necessary. An appropriate way of doing this in these days of rising prices, continued scarcity of certain materials and dearth of skilled labour, is prefabrication of the units in a central place and assembling them at the site. This method offers the right solution for the quick and economical construction of bridges and culverts. A start in this direction has already been made for construction of culverts on the National Highways.

Concrete mix

The main construction material in these structures is concrete. Concrete has all along been mixed in 1: 2:4 proportion by volume developing an ultimate strength of about 3,000 lb/sq. in. To effect economy and to control the uniformity, concrete mix is now prescribed in terms of strength standards. With prestressed concrete entering largely in bridge construction, concrete in strength varying, between 8,000 to 10,000 lb/sq. in. will have to be produced involving testing of aggregates for strength, voids and density, in the design of the mix.

The traffic on our roads is increasing in volume, weights and speeds are also going up and streets designed for limited traffic capacities are becoming congested causing traffic delay and accidents. It has become necessary to devise methods of avoiding traffic congestion, to facilitate quicker movement consistent with safety. The subject is complicated involving as it does the road, the vehicle and the road user. What is needed is collection of data and analysing the data statistically. These are accomplished by surveys carried out with special reference to traffic volume speed and movement and by studying requirements of intersections, junctions and parking conveniences. Such a survey, was conducted recently on Mount Road by the Highways Research Station.

Underlying Causes

The design of roads and road structures till recently was based largely on traditions and experience. Research seeks to discover the underlying causes of success and failure by investigating the mechanics of the road structure, the stresses caused by traffic and weather and their distribution through layers of road crust, and the most economical combinations of sub-base, base and surfacing and the effects of strong and weak sub-grades.

This sums up broadly the activities of road research now inprogress in the State and how it helps in the planning, design, construction, operation and maintenance of the various road systems in producing permanent, safer and more economical roads and road structures.

Games for Crippled Athletes

From many parts of the world crippled athletes went to Britain recently for the International Games for Paraplegics organized by the Stoke Mandeville Hospital, Buckinghamshire.

Contestants—Victims of infantile paralysis, the war, or road accidents—were thought until a few years ago to be hopeless cases. Now they competed in all types of events—archery, darchery (a specially devised adaptation of darts and archery), swimming, table tennis, fencing, basketball, snooker, weightlifting, throwing the javelin and putting the shot.

The games were inspired by Dr. Ludwig Guttman, Director of the Stoke Mandeville Hospital's spinal-injury unit. Dr. Guttman has spent years studying the physical, psychological and social advantages of sport for the disables. He started the games in 1948 between teams of disabled ex-servicemen. Four years later, a team of Dutch ex-servicemen entered.

Since then, the scope of the games has expanded enormously. Last year, the games reached the peak of their achievement when they were held in Rome after the Olympic Games. Twenty-one countries took part.

Viralimalai KURAVANJI

KUMARI N. SHYAMALA, *Research Officer, Madras State Sangita Nataka Sangham.*

[But for the timely efforts of the author of this article, now a Research Officer in the Madras State Sangita Nataka Sangham, who was responsible for rescuing and reconstructing the Viralimlai Kuravanji, this beautiful ballet piece of South India would have passed into oblivion. A scholarship in the Humanities from the Union Government and encouragement from the Madras State Sangita Nataka Sangham made possible the fruition of her efforts.]

Temples are the glory of Tamilnad. Their architectural magnificence is without parallel. They have helped to preserve the arts of music, dance and drama. These arts were incorporated in the rituals, ceremonies and festivals of the temples. The festival shows provided education through cultural entertainment to the masses, who were admitted free. The Kuravanji was one such entertainment which, with many others, has practically gone out of vogue, probably owing to changes in the complexion of life wrought in the first half of this century.

Standing mid-way between the art of the classes and of the masses and uniting them in a cultural tie is this dance-drama form. This type of art is a standing example of the healthy influence which the classical and folk arts have always had on each other. Kuravanji is a happy combination of two ancient forms, the Kuram and the Kuluva natakam which are two Prabandas of Tamil literature.

A scene from the 'Viralimalai Kuravanji'

Set Pattern

Generally Kuravanjis have a set pattern wherein the familiar story is told depicting the heroine falling in love with the presiding deity of the place or with a prince or nobleman whom she has accidentally seen while he was coming in a procession. Her longing for love and its fulfilment expresses itself in appeals to Manmatha, the God of Love, to the Moon, etc. She entreats her maids to relieve her suffering by bringing her lover to her. The maids are at a loss and bring Kurathi Singi, a gypsy woman who comes from a tribe that has a proud tradition for foretelling the future. She reads the palm of the heroine and predicts that her long-cherished desire for the love of her Lord would be soon fulfilled. At this juncture, Singi's husband Singan who has been looking for her joins her. After an interesting domestic interlude between the gypsy couple the play ends.

Viralimalai Kuravanji is built on this type of story. Viralimalai is eighteen miles from Tiruchirappalli, in the erstwhile Pudukottah State. It is a well-laid-out village and rows of houses surround a hillock on which stands a famous shrine of Lord Muruga, i.e., Subrahmanya. The hill is the abode of hundreds of peacocks and presents a picturesque scene of natural beauty. The temple on the top lends added splendour.

The inhabitants, were for the most part, families belonging to an artistic community that has been traditionally responsible for the preservation of Bharatanatya, the classical dance of Tamilnad. Thanks to these families, the Kuravanji named after Viralimalai had an unbroken tradition of practical exposition for nearly two centuries.

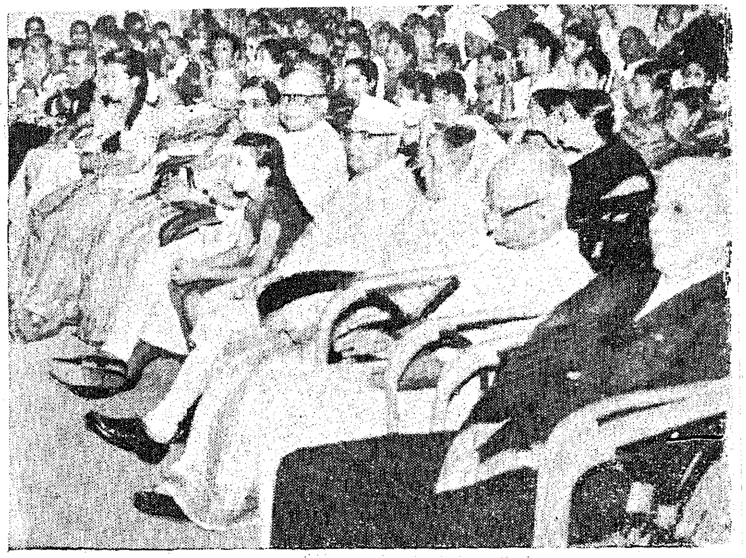
On Mahasivarathri night every year, till some twenty years ago, the Kuravanji was staged as an all night show to large admiring crowds of nobles, officials and ordinary folk in front of the Mandapam below the foot of the hill. Almost every family in Viralimalai had a 'manyam' (heriditary endowment) for the dance art and two families in particular had special additional 'manyams' for the Kuravanji. It was their business to keep alive the tradition of the Kuravanji and this they did successfully until owing to sociological changes and other factors the traditional staging of the Kuravanji got abandoned some twenty years ago.

The present generation not having learnt the art at all, the songs, the music and the dance of the Viralimalai Kuravanji today live just in the memory of a few old women who had taken part in the play years ago when they were young. There was, however, a sixty-year old manuscript containing the test of a major portion of the Kuravanji songs. With great difficulty and after considerable amount of persuasion, I was able to collect the manuscript from the concerned families. Old ladies Srimathi Annammal and Srimathi Govindammal and Sri Ramachandra Nattuvanar had to be won over to sing the songs for being recorded on tape so that, with the help of the recordings, a traditional dance-drama could be reconstructed and the beautiful remnant of an ancient art preserved for posterity.

Author Unknown

The hero portrayed in this play is Subrahmanya Mudaliar, the Second Administrative Officer to King Vijaya Raghunatha Thondaiman (1730 to 1769) of Pudukottah State. The author of the work is unknown. The date of the work (around 1750) places it in the pre-Thiagaraja period and, as such is of great interest in regard to the ragas and melodies used therein. The ancestry of Subrahmanya Mudaliar is traced to Sekkizhar, the great Tamil poet who wrote the Periapuranam.

In the Viralimalai Kuravanji as in other Kuravanjis the hero never appears on the stage but is only spoken of. The well-bred heroine Rajamohini falls in love with the hero whom she has seen accidentally in a ceremonial procession. The love-smitten heroine appeals to the Moon, Manmatha and the Thenral, Southern Breeze, for fulfilment and entreats her maids Sakhi and Suradavalli to bring her lover to her. They bring Kurathi Singi, who after describing the glory of her tribe, their traditional occupations, their extraordinary skill, etc., reads Rajamohini's palm and predicts that her desires would soon be fulfilled. In the heyday of this Kuravanji, two Kurathis danced in the place of one for the sake of symmetry and they delighted the spectators with their song, dance and scintillating wit. The play ends with a very interesting discussion between the Kurathi Singi and her husband Singan.



Governor Bishnuram Medhi was the Chief Guest at the 'Viralimalai Kuravanji' recently staged in the City.

The Modern Presentation

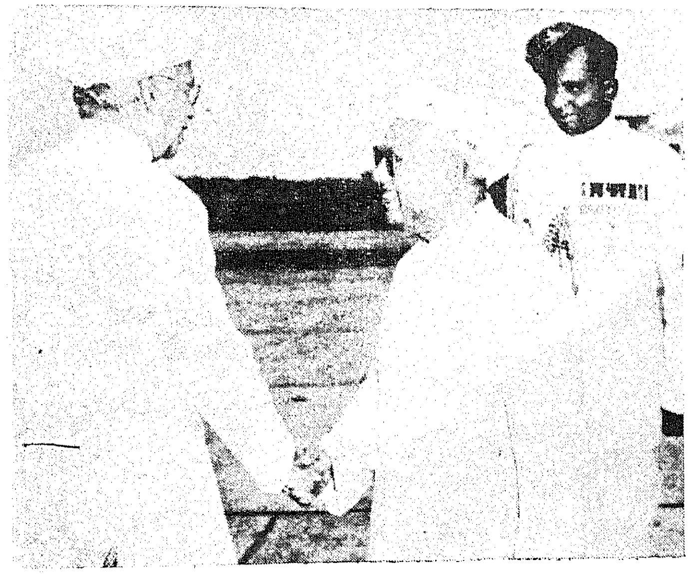
The Viralimalai Kuravanji as reconstructed today is a happy combination of classical and folk traditions in music, dance and drama though the former predominates. The dance and music of Rajamohini are purely of the classical type while one does observe touches of folk traditions in the dance and music of the Kurathi. The dance and music of the Kuravan, Singan is semi-classifical and may be termed as stylised folk art.

This Kuravanji, after a lapse of more than fifteen years was presented first to the public of Madras at the Annamalai Manram by me in December 1958, as an authentic research piece, during the Tamil Isai Sangam festival.

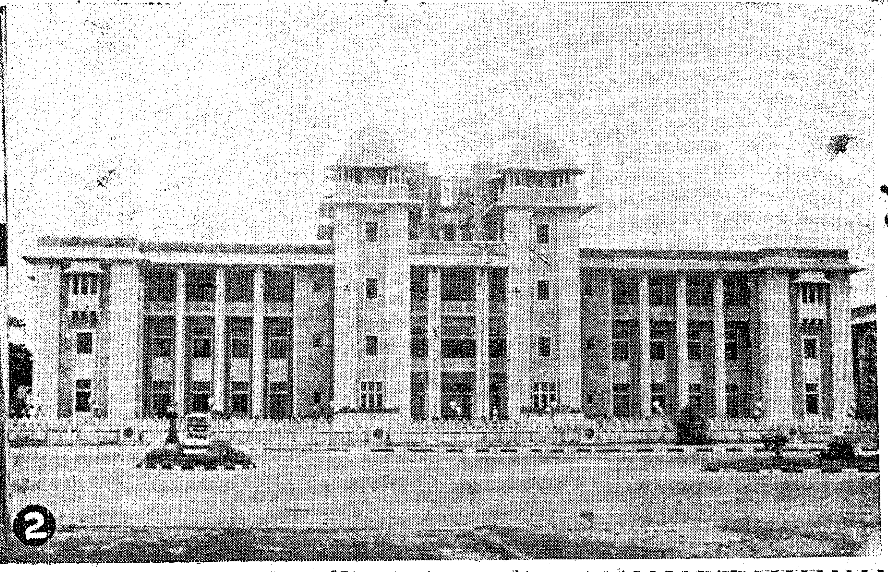
Governor's Appreciation

The Viralimalai Kuravanji was again presented to the public of Madras at the Mylapore Rasika Ranjani Sabha on July 27, 1961 by the artistes of the Nrithyodaya Art Centre with the benefit of aid from the Madras State Sangita Nataka Sangham which is considerably interested in reviving Kuravanjis and other dances connected with temples and their traditions. The presentation on this occasion had the added advantage of greater sophistication and showmanships lent to it by the superb dance direction of Natyakalakesari Vazhavoor Ramiah Pillai.

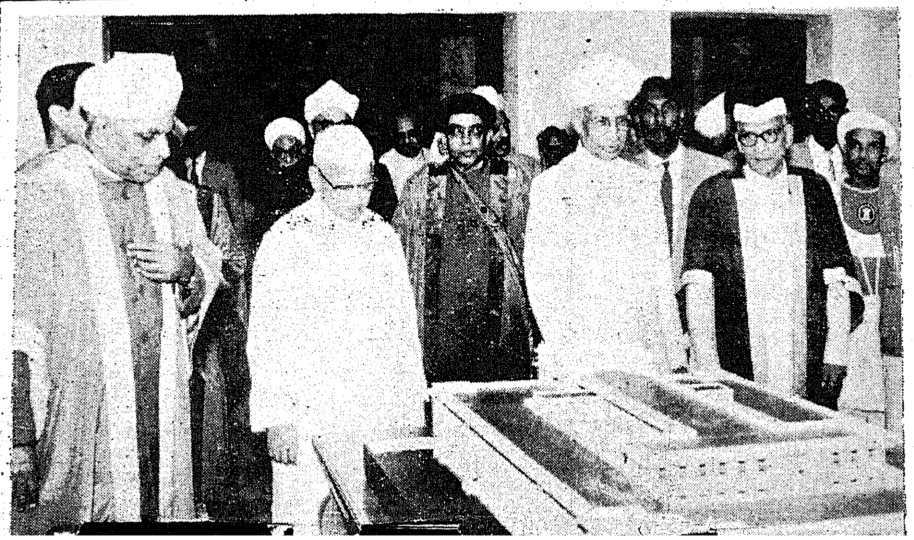
Governor Bishnuram Medhi who was the Chief Guest at the dance-drama was profoundly appreciative of the Kuravanji. Smt. Annammal, an old lady of Viralimalai who had herself played in the Kuravanji in days gone by, was present during the function. She had been specially brought to witness the dance-drama to the revival of which she had considerably helped. She distributed souvenirs to the artistes and players who participated in theshow.



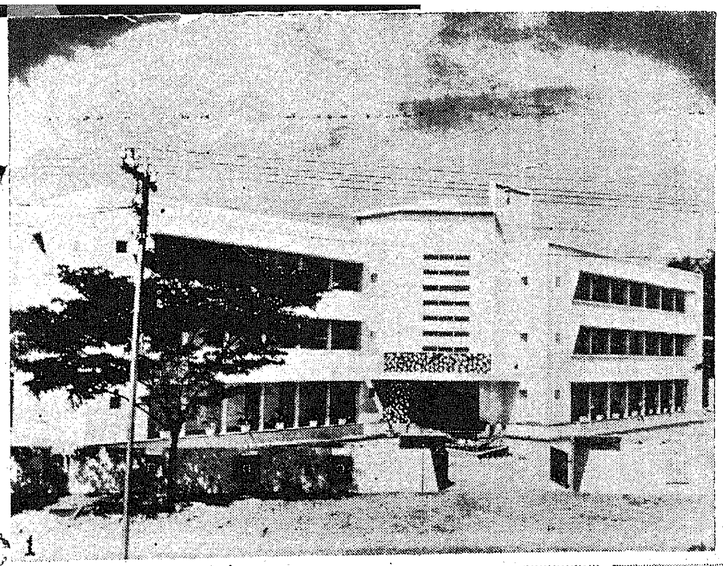
Vice-President Radhakrishnan fulfilled a number of engagements during his recent visit to the South of which the opening of the Centenary Building of the Madras University was the major event. (1) He was greeted on arrival at the Airport by Governor Bishnuram Medhi, (2) Opening the University Centenary Building, (3) Inspecting the Model of the Building, (4) Laid the Foundation Stone for the Chingleput District Central Library Women's Annexe.

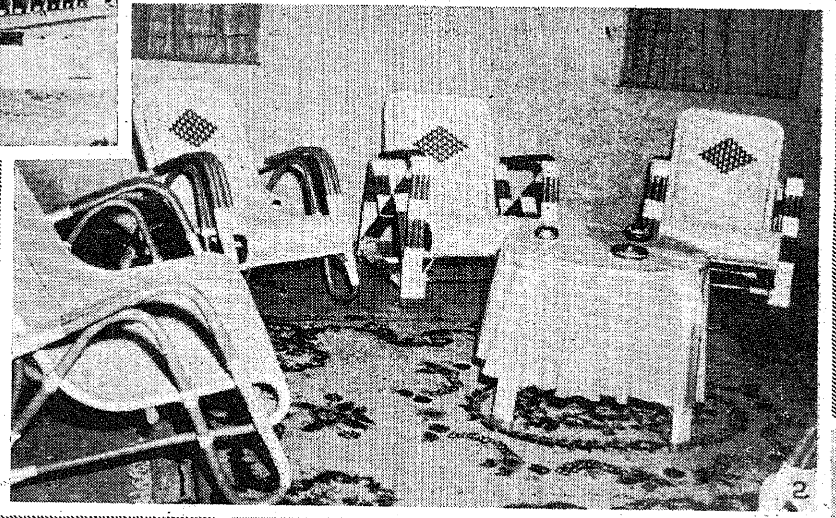


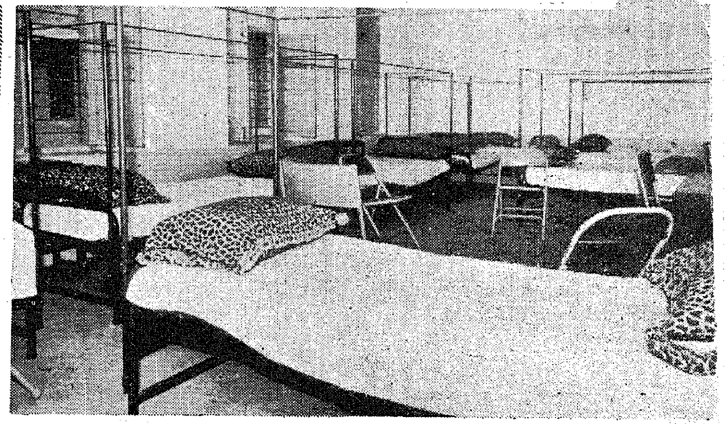
CE·PRESIDENT'S visit

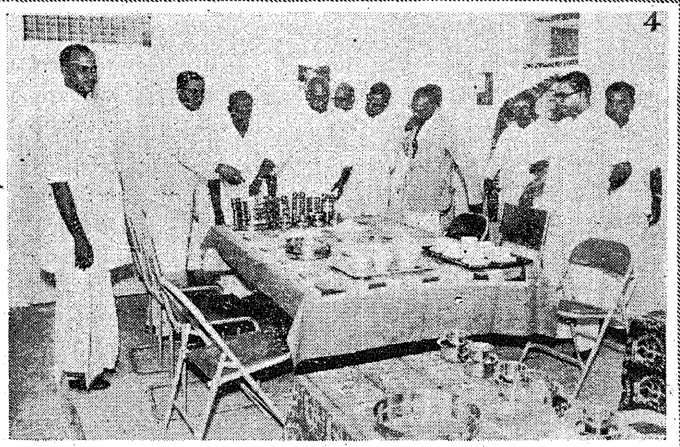


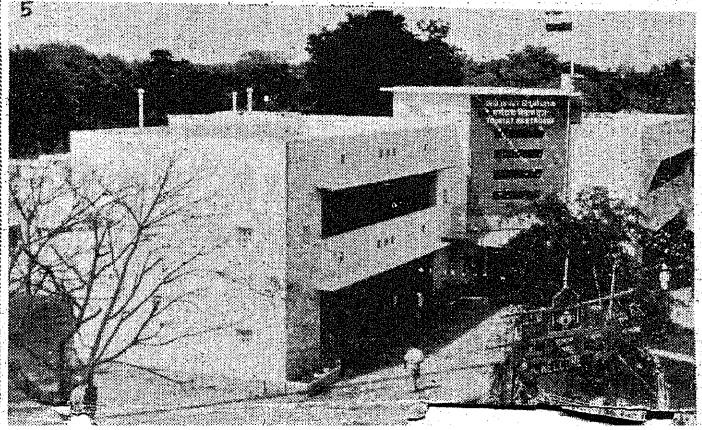
NEW Tourist homes











As part of the programme to provide good tourist homes for people with moderate means, two such rest houses were recently inaugurated in the State, one at Madurai by Chief Minister Kamaraj and another by the Union Minister for Transport and Communications, Sri. P. Subbaroyan. (1) and (5) The Madurai and Tiruchirappalli Rest Houses, (2) The well-furnished reception hall in the Tiruchirappalli home, (3) Large bed room specially designed for big parties, (4) Chief Minister inspecting kitchen utensil

Animal Husbandry in Third Plan

D. PATTABIRAMAN, *Director of Animal Husbandry.*

[*The progress under Animal Husbandry achieved during the First and Second Plans will be further consolidated and the work accelerated during the Third Plan. The Director of Animal Husbandry enumerates in this Article the Third Plan Schemes and the scope for development during the period*].

Before the launching of the Five-Year Plans, the scope for Animal Husbandry development was severely limited. During the First Five-Year Plan, with a modest provision of Rs. 56·28 lakhs, it was possible to make a start and the foundations for development were laid. The introduction of the All-India Key Village Scheme for intensive cattle development under which 15 Key Village Blocks were established, each covering about 2,000 cows and buffaloes of breeding age, the development of the District Livestock Farm, Pudukkottai, the establishment of a Sheep Farm for woolly sheep in Nilgiris and the starting of the stockmen course of 11 months' duration were the main achievements during the period.

The provision for Animal Husbandry was Rs. 217·48 lakhs during the Second Five-Year Plan of which about Rs. 200 lakhs have been spent. Substantial progress has been achieved during this period.

Key Village Scheme

The Key Village Scheme was intensified. In addition to the expansion of the Key Village Blocks started during the First Plan, 23 more Key Village Blocks each covering about 5,000 cows and buffaloes of breeding age were established in the breeding tracts. Nineteen Urban Artificial Insemination Centres were established to improve the milch cattle in urban areas. For the systematic utilization of the superior bulls produced in the Key Village Blocks, 46 Key Village Extension Centres were established in various districts, each centre with 50 bulls to cover about 5,000 cows and she-buffaloes of breeding age.

The calf subsidy scheme was intensified to ensure proper rearing of improved calves to maturity. In order to ensure adequate attention to the nutrition of the improved progeny a scheme for the development of breeds and fodder resources was introduced. Under this scheme 100 acres intensive pasture plots were established in Government Livestock Farms and seeds and grass slips were sold to the ryots at subsidised rates. Construction of silo pits was also subsidized to encourage conservation of fodder. Ten acres demonstration pasture plots were established in the Key Village Blocks in private lands by granting subsidies to the owners.

Livestock Farms

A District Livestock Farm at Chettinad, Ramanathapuram district, and a Sheep Farm at Kattupakkam, Chingleput district, were established. The existing farms were improved with additional buildings, soil conservation measures, sinking of more wells, etc. Four selected goshalas were also developed.

Twenty-eight Poultry Extension Centres with a foundation stock of 100 birds at each centre have been set up with a scope for expansion as Poultry Farms. Twenty Poultry grading centres were also started and 200 cocks of exotic variety have been distributed in each centre on exchange basis to grade up local stock. Private poultry breeders were encouraged by subsidies to develop their poultry farms and 253 farmers were also given six weeks training in Poultry Husbandry.

Sixteen sheep and Wool Extension Centres have been established for the development of sheep in compact areas. Pig breeding units and duck breeding units were introduced in some selected livestock farms.

Healthy Competition

Adequate attention to the control and eradication of cattle diseases was paid during the period. A mobile unit has been provided for each district to combat cattle diseases speedily and effectively and additional stockmen were appointed to assist Veterinary Assistant Surgeons in their work. Improvements of Veterinary Institutions were effected by electrification and supply of additional equipments.

In order to create a healthy competition among livestock breeders four State Cattle shows and 35 District Cattle Shows were also conducted in addition to numerous village cattle shows.

To meet the increasing demand for veterinary personnel, admissions to the B.V.Sc. and the Stockmen courses were increased. A Post-graduate degree course (M.V.Sc.) was introduced in the Madras Veterinary College and additional staff and buildings were provided.

The Third Five-Year Plan provides for a sum of Rs. 352·25 lakhs for Animal Husbandry developments in this State. The progress achieved in this sphere during the First and Second Five-Year Plans will be consolidated and the work further accelerated during the Third Five-Year Plan period.

Significant Results

Since very significant results have been achieved in cattle development through the Key Village Scheme, it is proposed to further expand and intensify the various aspects of this scheme during the Third Plan period.

Twenty additional Key Village Blocks will be established each with ten Key Villages attached to cover about 10,000 cows and she-buffaloes of breeding age. 7,000 selected calves will be subsidized. Fifty additional Key Village Extension Centres will be established in the districts to grade up local cattle with superior bulls produced in Key Village Blocks. The scheme for the development of feeds and fodder resources will be further intensified. Steps to ensure economical use of available fodder and conservation of fodder will be undertaken. The increased production of nutritious fodder grasses and leguminous fodder crops will be encouraged by subsidies.

Towards the achievement of the objective of establishing at least one Livestock Farm for each district, it is proposed to establish three additional livestock farms during the Third Plan period. Two of the existing farms will be further improved and expanded with additional stock, staff, buildings and equipment. Twenty more goshalas will also be developed.

Mixed Farming

A scheme for the development of mixed farming will be introduced. Ryots will be encouraged through loans and subsidies to keep milch cattle, sheep and poultry to provide subsidiary income and derive the benefits of mixed farming by raising crops in suitable rotation so as to provide food and fodder. Elimination of scrub bulls will be intensified in all the districts. Cattle shows at State, District and Village levels will be conducted and fodder and milk yield competitions will be organized as an incentive for greater production.

Since cattle play a very important role in the economy of the agriculturists and sudden losses of cattle would result in disruption of their economy, a pilot scheme for Cattle Insurance, the first of its kind in India will be introduced in the State during the Third Plan period. It is also proposed to undertake detailed surveys of Animal Husbandry practices and arrange for registration of cattle in the breeding tracts.

Sheep development

In order to intensify sheep development, an additional sheep farm will be established in Ramanathapuram district and twelve additional Sheep and Wool Extension Centres will be established. Since pig development would augment our food production, two big breeding units and four big development blocks will also be established.

Sufficient emphasis has also been laid in the Third Plan on poultry development. The existing State Poultry farms will be expanded with a view to increase the production of eggs and birds. Twenty additional Poultry Extension Centres will be established and seven of the existing centres will be expanded into poultry farms with 500 layers each. A plant will be established for the manufacture and supply of ready made balanced poultry feed to poultry breeders. Intensive development of poultry will also be undertaken in all rural areas through the introduction of forty thousand exotic cockerels on exchange basis in the villages.

Chick hatchery

Sale of day old chicks at subsidized rates to villagers will be undertaken to encourage them to rear poultry. A chick hatchery will be established to augment the production of eggs and birds to meet the ever increasing demand.

The Madras Veterinary College will be strengthened by additional staff, equipment and buildings. The establishment of a State Livestock Research Station for conducting research into problems of Animal Husbandry, a Foot and Mouth Disease Laboratory for study and production of a suitable vaccine for control and eradication of this disease, hide flaying and curing centre and a mobile bone crushing unit for improving the value of hides and proper utilization of carcasses are also included in the Third Plan.

As a result of all the above programmes of work, it is confidently expected that Animal Husbandry development would have reached an appreciable standard by the end of the Third Plan.

Sea Weeds Serve Mankind

V. D. SPURGEON, *Deputy Director of Fisheries.*

[*Are sea weeds of use to man as are plants on land. The answer is 'Yes'. They serve man in more ways than is known. Where are the sea weeds found, how are they useful and what steps are the Government taking to utilise them are some of the points dealt with in this article*].

Trees-gigantic and spreading like the banyan, towering like the palm, small shrubs, herbs, creepers, climbers, twiners and tender grasses represent the plant life on land, in forms varying and in colours kaleidoscopic. The foliage and flowers around not only add beauty and grace to the land but also serve humanity in numerous ways.

Home Minister Bhakthavatsalam planted a sapling at the State Forest School for training Foresters and Forest Home Guards which he inaugurated at Vaigai Dam recently.

Just as on land, there are plants beneath the sea. They are collectively called sea weeds. Some of them are rooted and some are free floating. Some of them are so small that they can be seen only with the aid of the microscope. Sea weeds are scientifically known as *Algae* and according to the pigments present in them they are named as *Green algae, blue-green algae, Red algae* and *Brown algae*.

Where Abundant

Weeds of different kinds are found in good quantities all around Madras coast. They are more abundant particularly off coral islands like Krusadai and Rameswaram. Generally coasts of the maritime districts like Ramanathapuram, Tirunelveli and Kanyakumari are considered as potential sources of sea weeds.

Unlike fish, collection of sea weed is very easy. Sea weeds are washed ashore in large quantities. One has only to walk along the coast gathering the weeds. It is a common sight to see bulky lumps of sea weeds tossed on the shores of Rameswaram, Pamban and Krusadai, by waves and high tides. Heaps of weed dried or half-decomposed, are seen along the entire coast of Tirunelveli, Ramanathapuram and Kanyakumari districts. At present all these green matter from the sea is wasted or made only little use of here and there.

Varied uses

One may wonder in what ways sea weeds are useful. Sea weeds are however used by us in one form or other, knowingly or unknowingly. To mention a few, they are used in food articles, medicines, manures and cosmetics.

Of all the products of sea weeds, agar is the most important and the most widely used. For good agar yield *Gracillaria lichenoides* is considered to be the best type of sea weed. It is capable of yielding large quantities of agar of good quality.

The sea weed is collected in large quantities and dried up in the sun. Then it is ground lightly with a pestle and mortar. Next it is washed well. Again the bulk is ground into grains. These grains are kept soaked in soft water for four hours and then filtered. The filtered solution containing fine grains is then transferred to a container containing boiling water with a little pottassium bi-sulphate and left for some time.

Agar Solution

The potassium-bi-sulphate separates the protein and dirt and the matter so separated settles at the bottom. The upper clear fluid is taken and filtered. This is the Agar solution. This is poured on a shallow wide plate and left until it gets solidified. This is cut into bits of the size 9″ long 3—10″ depth. These bits are spread on a plastic net and dried in the sun. The dried bit is the final product Agar. It looks like a translucent glassy strand. Agar manufactured like this is found by experience, as in no way inferior in quality to the Agar imported from foreign countries.

Agar is used in the manufacture of edible dishes for the table. While preparing desserts like 'payasam', a little agar is added to obtain the correct consistency. Similarly in the preparation of delicacies like 'Halva' agar can be added to hasten solidification. To get solidification to the required standard is always a problem in jelly preparation. If a little agar is added, this difficulty is overcome. Agar is used in the manufacture of bread, cake, powder milk, ice cream, jam, etc.

Agar is used in medicines also. It is mixed in pills to regulate its dissolving capacity. For dressing wounds and cuts agar is useful. The very common Iodine is manufactured from the sea weed—Brown algae. From the same sea weed alginic acid is prepared.

Sodium alginite is another product of sea weed which is as important as ugar. It is widely used in the manufafacture of cosmetics like face powder, snow, etc. In the production of greasy chemicals sodium alginite is used to maintain consistency and enhance keeping quality.

Shore-washed sea weeds form valuable and very nutritive fodder for cattle. In Western Countries feeding cattle with sea weeds is in vogue.

Good as Manure

Any sea weed can be converted into manure in the following way. The weeds should be dried well in the sun for days. Then it should be spread into a layer ½″ in depth and water sprinkled over it. Powdered cow dung should be spread over this layer to a depth of 1½″. Like this, alternating layers of weeds and cow dung should be piled up till the entire bulk is 4 feet high with a spread 6 feet in diameter. The heap so formed should be given a covering with wet clay. The clay covering should be 4 inch thick. Periodically the heap should be sprinkled with water. Left like this for two months the weeds get converted into manure of good quality.

Mineral Production in 1960

The value of mineral production in India in 1960 increased to Rs. 159 crores, according to the provisional estimates released by the Indian Bureau of Mines. The value of production in 1959 was Rs. 140·9 crores. This does not include the value of petroleum and atomic minerals prescribed under the Atomic Energy Act of 1948. The increase of nearly 13 per cent over the total value of mineral production in the previous year was mainly due to the increase in the output of coal, iron ore, bauxite, copper ore, china clay, dolomite, limestone and salt and the higher prices of gold bullion.

Consumers Own STORES

[As an organisation designed to secure for its members goods and services to their best advantage by reducing trading costs, consumers co-operative stores societies have become very popular. These societies appeal to all classes of people since all are consumers in one way or other. This article gives all the necessary information relating to the organisation and working of consumers stores societies and should be found exceedingly useful.]

A co-operative stores is an organisation of consumers designed to secure for its members goods and services to their best advantage by reducing trading costs. Unlike producers' societies which concern themselves with particular classes of persons in particular regions, stores societies appeal to all persons since all are consumers in one way or other. In this sense, it is open to the entire community to join these societies.

Stores Societies may be organised either for the benefit of the general public or exclusively for the benefit of community of persons such as public servants, mill employees and employees in other industrial undertakings. In fact, the organisation of this type of sectional stores has certain pronounced advantages, such as indentity of interests, homogenity of membership, mutual knowledge, etc.

Organisation

In organising a co-operative stores society, the first consideration is to ensure that the essentials of success are there. There should be a definite advantage to the members in the running of such a stores society. The loyalty of members, a scientific purchase programme in bulk at the producing centres, a steady volume of business and efficient management constitute the essential requisites for the successful working of a stores society.

The following are other points to be observed in regard to the registration of a society :—

(*a*) Sufficient amount of share capital should be forthcoming for running the Stores, say Rs. 5,000 in the Urban raea and Rs. 2,000 in the Rural Area.

(*b*) The District Co-operative Central Bank should be consulted regarding its willingness to finance the proposed society.

(*c*) At least a portion of the working capital should be raised by way of local deposits as evidence of the earnestness of the promoters without looking to the Central Bank for the entire finance.

(*d*) There should be suitable persons with requisite leisure and business acumen to take up the management of the stores and run its business.

Membership and share capital

Any person who is competent to contract and residing within the area of operations of the society is eligible for admission as a member of the society. It is also open to institutions like devasthanams, jails, hospitals, hostels, etc., to join as members of the society and make regular purchases from the society. In the case of smaller stores a minimum of Rs. 2,000 and in the case of bigger stores, specially in Urban areas, a minimum of Rs. 5,000 should be forthcoming as share capital. Ordinarily, the value of each share is fixed at Rs. 5. One of the effective ways of stabilising the position of stores societies is to enlist as many members as possible and build up a substantial share capital. The societies should normally depend to a large extent on their own share capital and deposits for running their business. They may however obtain cash credit accommodation from the financing bank subject to certain conditions.

Management

The executive management of the affairs of the stores vests in a Board of Directors elected from among the members by the general body of the society. The strength of the Board may consist of five or more members according to the size

of the society. The Board can meet as often as is necessary to transact business. The Board will attend to the following items of work, among others, for carrying on the business of the society:—

(*a*) The purchase of the required commodities in bulk at the proper season from the producing centres.

(*b*) Fixation and regulation of sale price.

(*c*) Maintenance of proper accounts.

(*d*) Periodical verification of stocks.

(*e*) Appointment of the required staff such as salesmen, cashier, etc.

(*f*) Proper display of goods handled and good salesmanship.

The Board, may, if necessary, constitute smaller sub-committees, like purchase and price fixation committee, accounts committee, etc., to run the business efficiently.

The ultimate authority

The ultimate authority in all matters relating to the stores, vests in the General Body. The General Body is vested with among others, the following powers :—

(*a*) Election and removal of directors.

(*b*) Adoption of audit certificate.

(*c*) Passing of annual budget.

(*d*) Expulsion of members.

Every member is entitled to attend the general body meeting and will have one vote. All questions in the General Body meeting are be decided by majority votes.

Co-operative stores sell commodities to members for cash at current market rates. Some stores societies, especially those formed exclusively for employees in Government commercial bodies, etc., where the members get monthly wages or salaries, sell on credit also subject to the condition that the pay disbursing officers agree to deduct the members' dues from their salary or wages every month and remit the recoveries to the concerned societies.

The requirements of members have to be assessed well in advance and proper arrangements made to purchase stocks in bulk in the proper season from production centres as far as possible. The primary stores societies can get themselves affiliated to the co-operative wholesale stores functioning at the district level in each district and purchase their requirement from the later. There should be adequate storage facilities where stock procured can be stored and released for distribution as and when necessary. A judicious selection of articles to be handled by the stores should be made bearing in mind consumer tastes. Quality stuff and fair price are the other essential factors that develop loyalty of members to the institution. Salesmanship and shop-keeping also play a vital part in its successful running. The staff in the stores should be taught to practice the art of "service with a smile".

Profit distribution

The strengthening of reserves is one of the effective measures to put the system of co-operative distribution on a stabilised basis. Though under the Act the societies are required to carry only 25 per cent of their net profits to the Reserve Fund, most of the societies have provision in their by-laws to carry a larger percentage of their net profits, say 40 per cent, to the Reserve Fund. Besides, provision is also made for carrying not less than 10 per cent of the net profits to a business loss reserve by way of abundant caution. The balance is distributed by way of dividend to members, Common Good Fund, Building Fund, etc., according to the provisions made in the by-laws. An important feature in the stores societies is that a portion of the profit is given back to the members by way of bonus or dividend on purchases in proportion to the quantum of purchases made by each member.

Government Assistance

With a view to enlarging membership in stores societies and enabling them to have a larger turnover of business and thus stabilise their position, Government have permitted stores societies to sell to non-members, temporarily, till 31st December 1961.

Governor Bishnuram Medhi, Chancellor of the Madras University, conferring the Honorary Degree of Doctor of Laws on Sri. P. V. Rajamannar at the Special Convocation in connection with the opening of the University Centenary Building by the Vice-President Radhakrishnan.

Special staff has been sanctioned for the supervision of stores societies and Government have been exempting the societies from the levy of supervision fees year after year.

With a view to developing the activities of stores societies, import licences are given to these societies in respect of specified articles subject to certain conditions.

Preference is given to stores societies in the matter of allotment of Fair Price Shops and the distribution of scarce commodities by the State Government.

Development Schemes

Besides the above concessions, the following schemes have been drawn up for the development of consumers co-operatives under the Third Five-Year Plan.—

(*i*) As State participation in the share capital of 100 stores societies, Government propose to take shares to a maximum of Rs. 2,500 each in 100 stores societies selected for the purpose.

(*ii*) Under a scheme to revitalise stores societies, Government propose to provide financial assistance to 100 societies by way of subsidy for the appointment of Managerial staff on a graded scale of Rs. 900 per annum during the first year, Rs. 600 per annum during the second year and Rs. 300 per annum during the third year, for each society.

(*iii*) Provision of financial assistance to 50 societies by way of loan of Rs. 5,000 to each for installation of coffee grinding machinery.

(*iv*) Provision of financial assistance by way of a loan of Rs. 20,000 each to 20 stores societies for installation of oil crushing and grinding machinery.

The formal steps

The essentials for the organisation of a stores society have been indicated in detail. When once the need for organising a stores society is felt by a group of people at a particular town or place, the organisers should send a formal application to the Deputy Registrar of the circle requesting for the organisation and registration of a stores society. The Deputy Registrar will thereupon depute his staff to investigate into the matter, conduct an organisation meeting and complete the organisation proposals together with the draft by-laws, etc.

The chief promoter of the proposal should arrange to collect the initial share capital from intending members and invest it in the local co-operative central bank or an urban bank. On receipt of the organisation proposals in complete form, together with the draft by-laws, the Deputy registrar after due scrutiny will register the society and its by-laws and grant to the society free of cost a certificate of Registration bearing the seal of his office together with a copy of the by-laws as approved and registered by him. The Deputy Registrar will also depute one of his staff for the starting of the society after its registration. This person will arrange to convene a meeting of the members, explain to them the objects of the society and the by-laws adopted and then arrange for the election of the first set of directors and allotment of shares to the original signatories in the application. The proceedings of the meeting will be duly recorded in the Minutes Book and signed by the Chairman of the meeting. Thenceforth the stores society will have formally commenced working.

Guide Dogs for the Blind

The Guide Dogs for the Blind Association is expanding in Britain and more blind persons than ever before are to have dogs to guide them about the streets. When the association's third centre is opened this month at Bolton, Lancashire, 24 blind persons a month will be taught how to use dogs. A fourth centre is planned for Scotland.

The Association has been in operation for some 30 years and, as a result of its influence and activities, there are more than 700 blind people with guide dogs. Ideal dogs for guiding are Labradors, Alsatians and Boxers.

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WEALTH FROM WOOD WASTE

J. DAYANAND RAO, *Forest Utilisation Officer.*

[*Use of waste wood as firewood and charcoal is uneconomic use of such wood when, considering the comparative poverty of the State's forest resources, they could be industrially exploited for conversion into boards, states the author of this article.*]

The area of potentially exploitable forests in Madras State is 0·14 acre per capita. This compares unfavourably with those of other countries like United States (3·0), Sweeden (7·9) and Canada (22·2). These figures indicate the very poor resources the Forests of Madras State afford.

It is therefore imperative that our meagre resources should be efficiently utilised. Maximum utilisation of wood waste and inferior species is therefore necessary.

Wastage in conversion normally occurs. Logging and sawing wastes range up to 50 per cent in the United States. In this 50 per cent, 25 per cent of the wood is left in the Forest to rot as logging waste and another 25 per cent is converted to waste wood during saw milling. In India however it is estimated that, that amount of wastage does not occur as much of it is used as firewood and charcoal. But this is an uneconomic use of waste wood which if utilised in a better way like converting into boards, would be far greater value. Thus the setting up of particle board or fibre board industries assumes great importance.

Hard Board

Hard board is produced from wood or such fibrous ligno cellulose raw material. The process consists of chipping and softening the chips under pressure by steam. Delignifying chemicals may be used. This is then defibred and wet or airfelted and then dried under heat and pressure in a hydraulic press. Binding materials may be used during such process.

Many species which are at present used only as firewood can be utilised for this purpose. In this connection it will be interesting to note that Asia produces only about 2 per cent of the world production of hard board and our country is producing a megre quantity.

However it has to be accepted that use of hardwood has not yet caught the imagination of the public in India where it is difficult to estimate the market. Hardwood is very popular in Europe and the United States.

The raw material

Location has a great bearing on the size of an economic plant. For India it is estimated that the minimum size for such a plant would be approximately 20—25 tons per day or approximately 6,000—7,500 tons per year. Such a plant would besides require 1,200 K.W. power per day.

Madras State offers excellent raw material for such a project in its wattle wood grown abundantly in Nilgiris and Palanis. In Nilgiris an area of nearly 16,000 acres is under wattle and this is being increased at the rate of 3,000 acres per year up to 1965. Similar is the case with the Palanis where also extensive work on wattle is on hand.

Similar is the case with the insulating board industries. Here also Asia is lagging far behind. Insulating board in India can be used for non-bearing house partitions, sound deadening acoustic tiles, roof decorating, etc.

Manufacture of Insulating board has been mentioned because this can be manufactured from bagassee. This bagassee must be available in good quantity in Madras State.

Chip Board

Chip boards as the name indicates are composed of distinct particles of chips, splinter, shaving, etc., which are binded together with an organic binder.

Use of chip boards are varied. A few of its uses are as Panel material for walls and ceiling interior and as care stock

or overlaid furniture and veneer board. Chip board is so versatile a material that it competes with the plywood industry.

The development of the chip board industry need not be delayed. Madras affords a favourable location for such a plant. Suitable wood species such as Blue gum and wattle are available and a market for the product can be created.

Paper Boards

Practically negligible is the amount of paper board that is manufactured in Madras State. With the rapid industrialisation of this State, consumption of paper board is bound to increase rapidly.

Paper board is generally used for cartoons and general packing of merchandise.

The raw materials most commonly used are rice and wheat straw. Waste paper is also an excellent raw material.

The most important factor in production is water which would be required at the rate of 2 milllon gallons per day for the smallest economic unit.

It is expected that industrialists would come forward to utilise the available raw material and thus help in the industrial progress of the State.

Data on availability of raw material

Area of Bluegum already planted — 6,749 acres.
Area of wattle already planted — 26,586 acres.

Future programme.

Year.	*Area to be felled in acres.*	*Wattle yield of wattlewood at 20 tons per acre.*	*Area to be felled in acres.*	*Bluegum yield of Bluegum at 50 or 60 tons per acre.*	*Total yield in tons (Air-dry).*
(1)	(2)	(3)	(4)	(5)	(6)
1961	500	10,003	..	..	10,000
1962	500	10,000	..	..	10,000
1963	500	10,000	..	..	10,000
1964	700	14,000	..	..	14,000
1965	700	14,000	500	25,000	39,000
1966	700	14,000	600	30,000	44,000
1967	1,800	36,000	600	30,000	66,000
1968	2,000	40,000	600	30,000	70,000
1969	2,000	40,000	600	30,000	70,000
1970	3,500	70,000	200	10,000	80,000
1971	3,500	70,000	200	10,000	80,000
1972	1,500	70,000	200	10,000	80,000
1973	3,700	74,000	100	6,000	80,000
1974	3,700	74,000	100	6,000	80,000
1975	3,700	74,000	100	6,000	80,000
1976	1,800	36,000	700	42,000	78,000
1977	2,000	40,000	700	42,000	82,000
1978	2,000	40,000	700	42,000	82,000
1979	3,500	70,000	200	12,000	82,000

The following quantities of wattleweed will be available in Upper Palnis (Kodaikanal Region), which can be used for preparing chip boards.—

Year. (1)	*Expected yields in tons.* (2)
1957–58	4,000
1958–59	9,500
1959–60 and 1960–61	13,000 per year.
1961–62 to 1964–65	7,000 per year.
1965–66	11,000
1966–67	17,900
1967–68	21,600
1968–69	27,000
1969–70 onwards	30,000 per year.

Police Village Development Scheme

[Under the Police Village Development Scheme the Police enter villages not with rifles and lathis, but with altogether different armoury consisting of crowbars, pick-axes and spades. They enlist the villager's co-operation in an effort to improve the village and give it a new look. And when their job is finished the village does wear a new look on account of the improvements accomplished in the villages' roads, houses, schools, etc., thanks to their efforts. The work by the police under this scheme presents the policeman in a new role. This article gives the review of work done under the Police Village Development Scheme for the year 1960.]

Development works were undertaken by the Police in all the districts, except Ramanathapuram, Tirunelveli, Salem and Coimbatore during 1960. The works taken up during 1960 were completed in Chingleput, South Arcot, Thanjavur Kanyakumari and the Nilgiris districts while in other districts the works undertaken will be completed during this year.

The position in respect of the remaining districts is as follows:—

In Chingleput district: In Gourikulam and Jabbarkhan villages, laying of a road (about a furlong) was taken up and completed. Madavakkam village was selected for construction of a Children's Park during 1961.

South Arcot District

In South Arcot district: A six furlong road was completed in Salai Agaram village. Mud road of one mile was completed in two villages viz., Melpathy and Arichanpalayam. Digging of a well and construction of a Children's Park were completed in Kudiraichandal villages.

In Thanjavur district: The laying of a road of about five furlongs was taken up in the Manakudy village and completed.

In Tiruchirappalli district: The formation of a grave road of 2½ furlongs was completed in the Pudur Uthamanur village. The formation of a playground, construction of a community hall and the construction of drainage are in progress and are likely to be completed in 1961.

Madurai District

In Madurai Urban district: The Inspector-General of Police has stated that the construction of a drinking water well, a bath room for ladies a recreation club and a play ground are in progress.

In Madurai North district: The construction of a road deepening of a well and repairs to the parapet wall, construction of a Children's Park, a volley ball court, tree planting and cleaning of the village of Vadugapatty are in progress.

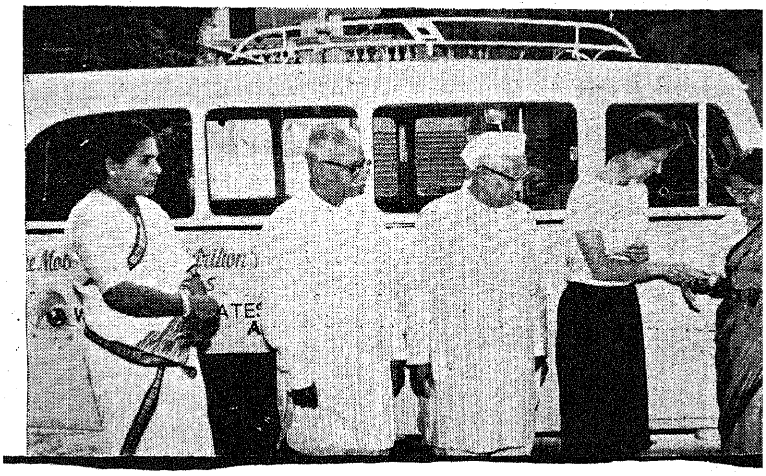
In Ramanathapuram: The Inspector-General of Police has stated that the formation of a road in Chinnadaipathy village of Sattur circle could not be done as the site had not yet been acquired due to the difficulties experienced in obtaining the consent of land owners to part with their lands. The Inspector-General of Police has stated that this work will be taken up, when the consent of all the persons concerned are obtained.

In Kanyakumari district: In Mandarampudur Agatees waram village, the construction of a community hall was taken up and completed from the contributions received from the public.

In North Arcot district: In October 1960, the work of constructing a building under Project Implementation Committee, Vellore, at Nanganadhi was taken up and is in progress.

nI the Nilgiris district: A recreation ground for the children of the Elementary School of Bettala village was taken up and completed.

Srimathi Sakuntala Subramaniam receiving the keys of the Mobile Nutrition Van from Mrs. Galbraith, wife of the American Ambassador to India, presented to the Guild of Service by the Wheat Associates of America for the use of the Mobile Extension Nutrition Programme.



Science in the news

[Everyday that passes in this Age of Science registers some important advance or other as a result of which new and improved techniques and devices emerge to lighten the burden of the housewife, the common artisan, the small businessman and the big industrialist. This feature takes note of such developments. Apart from advances in the Indian scientific field, interesting developments reported from the United Kingdom and the United States are also included]

Researches carried out on forage breeding at the Indian Agricultural Research Institute in recent years have provided information of considerable practical value.

The grasses mainly suited for the arid and semi-arid regions of the country are chiefly under study. In addition, work is also being carried out on cultivated fodder grasses.

By careful selection of Indian as well as foreign material it has been possible to isolate a large number of distinct varieties differing in character; forage yield, leafiness, nutritive value, resistance to heat or cold and seasons of active growth. Differences have also been observed within single species in chromosome numbers and some of these intraspecific chromosome races have shown many desirable features which are considered essential for good strains of forage grasses.

The hybrid Pusa Giant Elephant grass resulting from crossing of Elephant grass with cultivated bajra, it is found, can be propagated vegetatively by means of "slips". It yields twice as much forage as Elephant grass and has high protein content. The leaves are softer and more palatable than Elephant grass. Similarly by crossing an Indian species of anjan grass and related American species, a high yielding hybrid Pusa Giant Anjan has been produced.

Coconut Kernel

In experiments carried out by the Central Coconut Research Station, Kasargod, on steaming husked nuts to facilitate removal of the kernel from the shells it was found that this treatment proved very useful without causing any adverse effect on the copra and its oil content.

Experiments on the effects of temperature, humidity and air velocity on the drying rate of coconuts in the cup form revealed that the drying rate was a factor only of the rate of moisture diffusion to the outer surface and therefore on the temperature of drying. The other two factors apparently have little effect. Flow drier appears to be better suited than the cross flow drier for the drying of coconuts in the cup form. Above an air temperature of 60°C there was a tendency to get charred.

However, it was found that by employing an initial higher temperature at 70°C for the first eight hours and then completing the drying at 60°C it is possible to reduce the total drying time considerably without affecting the quality of the product. The milling quality of mechanically dried copra compared to sundried copra is now being studied at the Research Station.

Bhopal Clay

Investigations conducted at the Central Building Research Institute, Roorkee, indicate that Bhopal clay is suitable for producing a sintered type lightweight aggregate.

Light weight aggregate is used in all types of concrete construction where weight reduction, thermal insulation and fire resistance are desired. Of late, such aggregates are being produced with clay as a binder in place of cement. Also bricks bonded with clay develop, after firing, high compressive strengths and are more economical.

Little attempt has been made so far to exploit Indian clays for making lightweight aggregates. After extensive trials, a process has been developed at the Institute, which eliminates the use of sulphite lye and is applicable to a large number of clays.

Underground water movement

Scientists in Israel have tried out radio-active isotopes for tracing the movement of underground water and assessing underground water resources.

The reservoirs of underground water constitute about two-thirds of Israel's total supply and therefore contribute vitally to the development of Israel's Industry and agriculture. Better than the method of "marking" water with a dye or easily detectable chemical label such as salt or starch for tracing the flow of water below ground, isotope labelling and mapping its movement with Geiger counters proved effective.

Cheap, long life isotopes, non-injurious to the health of animal and plant life, were found to be radio-active iodine, cobalt and iridium charged chemical form.

The negative charge was repelled by the soil generally and therefore stood a far better chance of breaking through the positively charged soil. Small scale tests with radio-active iodine in the Carmel Range were successfully traced to neighbouring boreholes and they established that water tracing by isotopes could be conducted over a considerable distance.

Power from Tides

The ocean wastes 36,000 million kilowatt-hours every day in the tides. This lost energy corresponds approximately to all the power used by the earth's population in twenty-four hours—electrical, mechanical or animal power. Harnessing the sea, is, therefore, a very tempting prospect.

The dreams of the pioneers of tidal power have become a reality, says a UNESCO news report, after twenty years of research and experimentation. The Rance "tidal trap," capable of forcing the sea to lend a few crumbs of its colossal power, will supply an average of 544 million kilowatt-hours per year. The decisive element in this victory of science has been a strange pot-bellied machine weighing eighty-nine tons, with a four-bladed propeller at one end. It resembles a huge airplane engine.

The First Plant

The construction of the world's first tide-driven electric power plant, begun at the end of last year, will be completed in the spring of 1966 at the mouth of the Rance River near St. Malo, in France. It will take six years to close the estuary of this river in Brittany with a dike 2,600 feet (800 meters) long. Then twenty-four turbo-generator sets will go into service. Each of these sets, composed of a generator driven by a turbine in the form of a ship's propeller, will be housedin a submerged water-tight shell. Driven by water flowing at a rate of 635,000 cubic feet per second, this "battery" of turbo-generators will feed 240,000 kilowatts of current into the French power grid, both for industry and domestic purposes. (The kilowatt is a unit of electric power corresponding to 1·36 horse power. As an example, a light bulb can consume 100 watts, or one-tenth of a kilowatt.)

If all goes according to plan, even more daring undertakings will become possible. For example, the huge neighbouring bay of Mont St. Michel could be closed off. Then the sea would provide from ten to fifteen million kilowatts per second that is, fifty to sixty times more than the Rance tidal power plant.

Pitfalls

Astronomists, however, warn us that there may be a few pitfalls on the road to electricity from the sea. Tides are of astronomic origin because they are the result of the influence of the sun and the moon upon our planet. That tidal energy which is going to transform into electricity must be taken from somewhere. It is taken from the kinetic energy of the earth's rotation. The more tidal power plants are built, the more the earth's rotation speed will be slowed up.

This "breaking" will not be very serious. If we harness the equivalent of 1,000 million kilowatts of power, we will end up by losing about ten hours over 2,000 years. We have lost just about this much since the birth of Christ without generating electricity during that time. The energy was simply frittered away in the breakers.

Sulphuric Acid Production

Recent investigations by the Indian Bureau of Mines on the technical and economic aspects of utilizing the pyrite deposits of Amjore in Bihar for the production of sulphuric acid are reported in the July issue of *Research and Industry*, a monthly periodical published by the Council of Scientific and Industrial Research.

In India, almost all the units producing sulphuric acid are based on elemental sulphur which is now entirely imported. The projects for producing sulphur locally assume considerable importance in view of the rapidly mounting requirements of sulphur for the production of sulphuric acid. By 1965–66, it is estimated, India would be importing 400,000 tons of sulphur for production of sulphuric acid.

Studies have shown that the production of elemental sulphur by the Norwegian Orkala process would be economical in India if the pyrite is made available at Rs. 35 per ton.

Another possibility examined is the setting up of pyrite burning units as an adjunct to a steel project. The resulting iron oxide could be utilized for the manufacture of pig iron and steel.

Taking into consideration all factors the study report recommends the installation of chemical plants within a radius of 200 miles from Amjore to derive maximum advantage from the pyrite deposits t here.

The Amjore pyrite deposits form the most promising source of sulphur in India. This locality is estimated to have a reserve of about 384 million tons of sulphide ore in an area of 48 square miles. About 78 million tons of these are proved reserves containing on an average 40 per cent sulphur.

Fuel Ash aids Farming

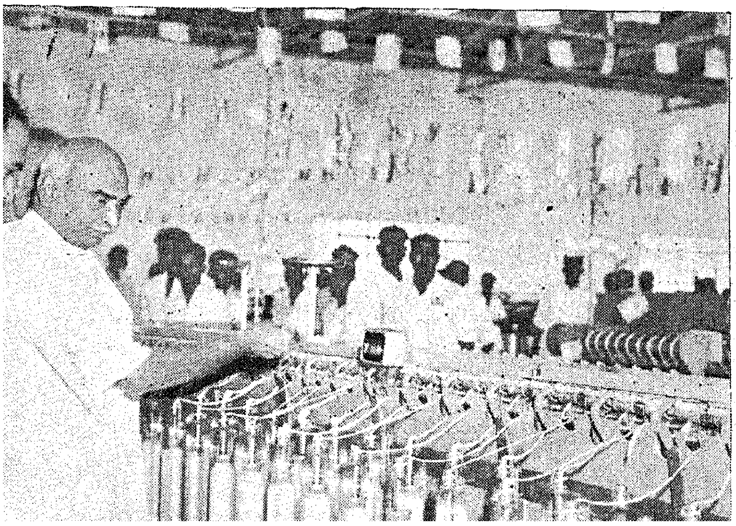
Useless marshes have been successfully reclaimed to form rich pasture land in the United Kingdom by means of fuel ash from a power station.

The cementing properties of pulverized fuel ash from power stations have already been established. The ash is used in a number of ways, including construction material for dams, highway embankments, power-station foundations, and as a " filler " for roads.

One of the latest examples of its versatility is in Flintshire, Wales, where a fertile field has been created from the marshes by means of ash from the nearby Connah Quay power station, which produces some 70,000 tons of fine ash each year. A mixture of water and ash was directed into a lagoon. The water was drained away through filters into the river, and the ash, when it reached the rim of the lagoon, was ready for levelling sowing and cultivation.

The first experimental 40 acres have been used for arable and grazing purposes with conspicuous success. Grass and clover have grown richly and sheep and lambs have thrived on the pasturage. Now cattle are to be introduced. The ground has also yielded good root crops, though so far cereals have not come up to standard. By October another 57 acres will be reclaimed for farmland and a further 70 acres are planned.

Chief Minister Kamaraj switching on one of the units inside the Ramanathapuram Co-operative Spinning Mills, Ltd., Srivilliputtur, recently inaugurated by him.



Apart from land contribution, the scheme, which may be extended to other low-lying ground in Britain near power stations, helps to relieve the ash-disposal problem.

Robot to aid Miner

A robot with its own built-in power supply is being developed as a by-product of fuel research work at Sheffield University.

The robot could be used in working conditions dangerous to man, such as putting out fires in hot smoky conditions or mining and shovelling coal in seams too narrow and deep for miners.

Professor N. W. Thring, head of the Fuel Department at Sheffield University, explained how the robot works. Its course of action is a simple chart which it scans through photo electronic cells and impulses produced and then translated into directions to drive and steer.

Professor Thring said these impulses can also make the robot carry out set tasks at appropriate times with the aid of an electronic memory and to make corrections to the original chart from information gained on the journey.

Exploring Space by Sound

An instrument for the radio exploration of space has been installed on a disused airfield at Defford, Worcestershire, by the Royal Radar Establishment of Britain's Ministry of Civil Aviation.

The instrument is a radiotelescope interferometer—a major addition to Britain's facilities for space research.

The interferometer is an instrument for measuring wavelengths, and the one at Defford will explore space by sound, " listening in " to the stars, the sun, moon, and planets as well as earth satellites and space probes.

The instrument consists of two giant radiotelescopes, each weighing 250 tons, which can be driven along double railway tracks and directed to any part of the sky. The instrument's parabolic reflectors are 82 feet in diameter, made of fine wire mesh, and can be operated over a wide range of radio wave lengths which can track any radio source as it moves across the sky.

D. Napier and Son (a subsidiary of English Electric) and Pan Britannica Industries have developed a new type of aircraft, the Agricultural Gyroplane, for use in crop-spraying operations.

The Gyroplane is a small, light aircraft in the autogyro category, with a rotor like that of a helicopter. The pilot sits in the open, thus having all-round vision, which makes

crop-spraying in small fields much simpler. The machine is claimed to be easy to transport and fly and, when necessary, can be repaired under the most primitive conditions.

Pan Britannica Industries is now preparing to undertake operational evaluation of the concept both in static tests and in practical tests on farms. At the same time, both companies are carrying out a comprehensive study of the Gyroplane's operating costs compared with those of a fixed-wing aircraft.

It is believed that the new aircraft will cut operation costs by half. Production on the Gyroplane will, however, not begin until the vehicle's potentialities have been fully analysed.

New Carding Device

A new device that reduces cotton carding waste in textile mills by more than half has been developed by the United States Department of Agriculture's Southern Research and Development Laboratories at New Orleans, Louisiana, called the SSRL Granilar Card, it has already been installed in more than 70 cotton mills. These users report it saves 50 to 60 per cent of fibre normally discarded as waste in the carding operation.

Simple and inexpensive, the Granular Card is a non-moving cover that replaces an elaborate assembly of moving parts—called " flats "—on standard textile carding machines. " Granular " describes the underside surface of the fixed cover that comes into contact with the cotton in the carding process. It weights but 200 pounds compared with the 1,000 pounds of the assembly of flats it replaces and does a better job of " carding " disentangling the fibres before they are spun into yarn. Completely sealed, it eliminates a major source of dust and " fly " found in textile mills. Maintenance is inexpensive, only a single part being subject to wear.

Cotton Fibre Maturity

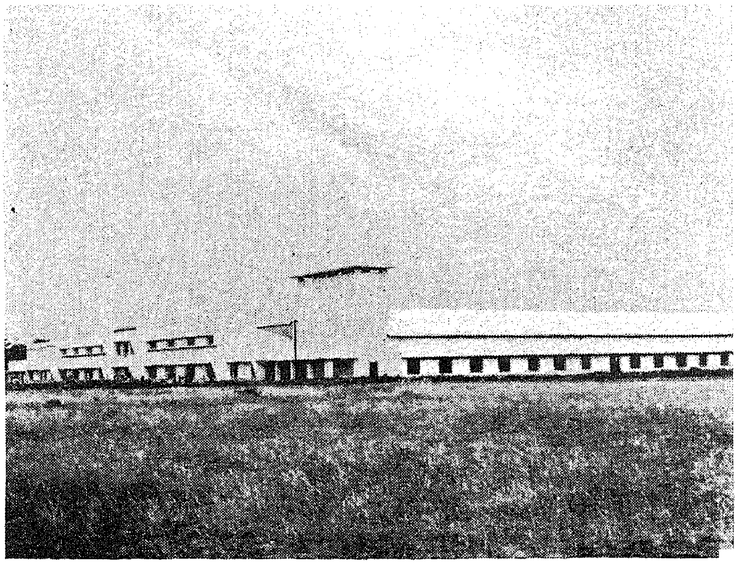
An improved technique for determining maturity of cotton fibres has been developed by United States Department of Agriculture (USDA) scientists. They have proved that an instrument named the Micronaire can be substituted for the present costly, time-consuming tests for measuring the maturity of cotton fibres.

Fibre maturity has an important effect on appearance of yarns and fabrics. Immature fibres aid formation of tiny tangles, fail to accept dyes uniformly, and increase waste.

In USDA tests the Micronaire has accurately measured the rate of air at a given pressure passing through a standard volume of cotton, the finer the fibres the slower the rate of air passage, thus gauging maturity.

Ultrasonic Milk Tester

Three dairy scientists recently invented a device that simultaneously tests milk for butterfat content and for percentage of non-fat solids. It was demonstrated at the University of Wisconsin. The instrument, called the Darisonometer by its inventers, measures the fat and solids content of the milk by means of electronics and ultrasonics—sound waves of extremely high frequency, higher than humans can hear.



A view of the Ramanathapuram Co-operative Spinning Mills, Ltd., Srivilliputtur.

It works on the principle that sound waves move at different speeds through materials of differing composition—faster through solids than liquids. The instrument measures the speed at which the sound waves move through the milk and the velocity is recorded on dials showing percentage of solids-no-fat and butterfat. The method has been found extremely accurate.

Seasoning of Hardwoods

A new method of drying lumber—called solvent seasoning—may open the way to wider use of the world's hardwoods, according to California timber experts. The method, developed at the University of California's Forest Products Laboratory, has been used successfully to dry tanoak sapwood to ten per cent moisture content in 25 hours with relative freedom from seasoning defects. Normal seasoning by air-drying and kiln-drying methods takes months.

In the new process the green boards are stacked vertically in a vapour-tight extraction chamber and a hot solvent—acetone heated to 130 degrees Fahrenheit—is circulated over the timber by means of a pump at atmospheric pressure. The acetone removes water and chemical extractives as it travels through the boards. By continuous distillation, the acetone is removed from the chamber and then recirculated over the timber after purification.

Killing the Hurricane

The United States has its first hurricane hunter in space—a weather satellite capable of photographing the destructive life of a hurricane from birth to death.

With the unprecedented view provided by a satellite, scientists are hopeful of discovering how hurricanes are born and perhaps eventually a method of dissipating the storms before they pick up force.

If the satellite gives advance warning of the approach of even one otherwise undetected hurricane it could bring about tremendous savings in human life and property that otherwise might be lost.

The new 285-pound weather satellite, Tiros III, rode into space aboard a three-stage Delta rocket fired on July 12 from Cape Canaveral, Floridia.

It was the third in the Tiros (Telivision Infra-Rets Observation Satellite) series of the National Aeronautics and Space Administration (NASA) and the forerunner of, the operational "Nimbus" satellite system scheduled for 1962 and 1963. Several Nimbus satellites will be in orbit simultaneously to provide global weather coverage.

New method Food Freezing

A new method of preserving foods by freezing them at extremely low temperatures has been patented in the United States. Frozen foods packed by this method have already been shipped from New York to such far-distant lands as Japan and Ceylon and have arrived in perfect frigid condition as much as six weeks after the time they were frozen.

The process employed, which is relatively simple, uses liquid nitrogen, which boils at the extremely low temperature of 320 degrees below zero Fahrenheit. Filtering through the wrapping material, the nitrogen evaporates when it touches the relatively warm surfaces of the food. The resulting nitrogen gas drives all the air from the food's airtight container, and the frozen food is then sealed.

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New Operation to cure Common Deafness

A new cure for the most common kind of deafness has been evolved from techniques developed by a British surgeon working in hospitals in South Yorkshire, England.

Deafness has a variety of causes ranging from ear infection to mechanical damage. Its incidence is world-wide and some 20,000,000 to 30,000,000 people are estimated to be affected.

Otosclerotic deafness is most common, and it is this kind that can be cured completely by operation. This condition is half as common in men as in women, in whom the onset of the disease is often accelerated by pregnancy. It is estimated that there are between 8,000,000 and 10,000,000 cases of otosclerotic deafness in the world (200,000 in Britain), with a large number of undiagnosed cases in India and Africa.

Mr. P. H. Beales, consultant aural surgeon to a group of South Yorkshire hopitals, described in an interview something of the disease and of the success he has been achieving with the operative technique he has evolved to cure the condition.

Operation Technique

Otosclerotic deafness is caused by the random growth of soft bone on and around the innermost sounding-board of the ear, which is ulitimately responsible for transmitting sound vibrations from the eardrum across the tympanic cavity to the nerve complex that feeds the brain. Growth of a soft bone makes this vital structure incapable of responding to, or transmitting, the vibrations it receives.

An operation to cure this condition is carried out under a special microscope that was invented in Britain. It involves moving to one side the eardrum and the bony link in the hearing chain, removing the soft bony deposits and cutting out the defective membranes. New tissue is then fitted by grafting-in a small piece of vein taken from the back of the patient's hand. The hearing chain can then be replaced, usually with a connection made of wire or polythene tube.

In Mr. Beales' technique, to avoid complications that can arise with synthetic materials, a permanent and accident proof contact is made with the tissue by bringing back into contact with it the prongs of the original bony structure.

Mr. Beales has now performed about 100 of these operations on patients selected from the 2,000 or so of these cases existing in his area. So far, 80 per cent of cases treated have recovered their hearing after having been completely deaf.

Radio Pills aid Diagnosis

" Radio Pills ", which are being used for research in hospitals in Sheffield, England, are expected to produce better techniques for early diagnosis of bodily ills, particularly those of the digestive tract.

The pills are a British development of a Swiss idea. They are already in commercial production as tiny cylinders half-an-inch long by a quarter-inch in diameter, but researchers at Sheffield prefer to make their own, and the radio receivers to go with them. The Sheffield pills are the same size as the commercial product, but have pressure-sensitive plates made of silver-plated metal giving better performance than the plastic alternative.

Dr. B. Ross, of the surgery department at the Royal Infirmary, Sheffield, said that using a kind of pill that transmits information on pressure, they have found that it is the stomach which is slow to recover its contraction rhythm after abdominal operations. Other parts of the canal recover in a much shorter time. As a result, it has been possible to devise better feeding arrangments which bypass the stomach, make the patient more comfortable, and speed his recovery.

Chief Minister Kamaraj greeting Mr. Galbraith, American Ambassador to India, who called on him at the Secretariat during his visit to the City recently.

Dr. Ross said that using pills to collect information on pressure rhythms associated with known diseases such as duodenal and stomach ulcers, it is hoped soon, by recognizing characteristic rhythm patterns, to diagnose these diseases more positively.

By developing radio pills capable of transmitting information on temperature or acidity within the body, it should be possible to evolve methods of diagnosis for other ailments. Dr. Ross said they expected to have an acidity-detecting pill in use soon.

Irradiated Syringes

Hypodermic syringes sterilized by exposure to nuclear radiation are being used in a large-scale programme of anti-poliomyelitis injections now being carried out in the Liverpool area.

So far, around 300,000 injections have been administered, and it is anticipated that this month at least as many more will be given. A further similar batch will follow a few months later. The bulk of the syringes used in the programme are radiation-sterilised.

These plastic syringes are made completely germ-free by subjecting them, each in an airtight container, to radiation in a lerge gamma-irradiation unit known as a " package irradiation plant " in the United Kingdom Atomic Energy Authority's research laboratory at Wantage, Berkshire.

Irradiation does not make the syringes radioactive.—Disposable syringes—used once only—avoid cross—infection risks and speed up the rate at which patients can be treated. The syringes are mass-produced, and cost per injection is comparable with injections using traditional syringes which have been cleaned, repacked, and resterilized.

Gamma-radiation sterilization is used because it is highly efficient in destroying germs. It does not affect plastic material because it does not raise the temperature of the irradiated object by more than a few degrees.

Rare Lung operation

A unique operation has saved the life of a woman near death from blood clots in her lungs. The operation, first of its kind reported in the United States, involved surgery to remove the clots while a heart-lung machine took over the work of the patient's heart and lungs.

The life-saving surgery, performed by three Texas doctors, in Houston, required 15 minutes. The woman returned home to her normal household task just two weeks after the operation. An account of the surgery is reported in a recent issue of the Journal of the American Medical Association.

The achievement, the Journal said editorially, " should be considered another milestone in cardiovascular surgery " and the technique " may lead to saving many similar patients who are otherwise doomed to almost certain death. "

In the operation the doctors opened the main pulmonary artery leading to the lungs and withdraw the clots with instruments and suction. They repeatedly collapsed the lungs to remove clots lodged deeply in the smaller branches of the lung's arterial network.

Except for a mild fever the first three days after the operation, the patient convalesced in a " smooth uncomplicated " manner, the doctors said.

Many persons suffering massive blood dots in the lungs die almost instantly, but it is not uncommon for some to survive one or more hours.

The trio of doctors operated on the 37-year old woman 42 hours after an examination showed the clot attack was imminent. The decision to operate was made at midnight. Two hours later the heart-lung machine was readied and hooked up to the woman's lungs and heart, and the operation performed.

Previous attempts to clear up the condition by surgery have been generally unsuccessful, the doctors said. However, they said a successful operation was performed last year on a male patient without use of a heart-lung device. The man's body temperature was lowered with ice packs and his blood circulation halted briefly.

Guanethidine

Successful testing of a new orally administered drug has shown in test studies that it is capable of controlling severe high blood pressure, a group of three American physcian reported in the Journal of the American Medical Association.

The physicians say that the drug, guanethidine, represents a new approach to the treatment of high blood pressure. It differs radically from other drugs now being used for the condition, because it acts on the arteries and veins rather than on the brain and nervous system.

In their test study, the physicians observed 16 patients for periods of one to eight months. Guanethidine gave " good control in fourteen of the patients, with minimal side-effects and no toxic manifestations, " they reported.

Epilepsy Drug

A drug known as Diamox Acetazolamide, long used in treatment of the eye disease glaucoma, appears to be effective against epilepsy, the convulsive nervous disorder that afflicts some 10,000,000 persons around the world. In a five-year study with 178 epileptic children at the Blue Bird Circle Children's Clinic, Houston, Texas, the drug was found considerably to reduce the number and severity of seizures. Researchers suggest that Diamox causes a build-up of carbon dioxide in the brain, thus interfering with nerve impulses in such a way as to reduce convulsions.